THE LANCET

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

Telegrams—LANCET, WESTRAND LONDON. *Telephone*—GERRARD 4314 & 4315. *Offices*—423, Strand, London, W.C.

No. III. OF VOL. I., 1928. **No. 5447. Vol. CCXIV.** LONDON, SATURDAY, JANUARY 21, 1928 Founded 1823. Registered as a Newspaper. Published Weekly. **Pp. 128—Price 1s.** Annual Subscription, Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 2.

NEW AND ENLARGED EDITION. With an additional plate at 15s. net; post free, inland 15s. 9d., abroad 16s. 6d.

CONTRACEPTION
ITS THEORY, HISTORY AND PRACTICE.
A Manual for the Medical and Legal Professions and all Social Workers.
By MARIE CARMICHAEL STOPES, D.Sc.,
Fellow of University College, London.
Introduction by the late Prof. Sir WILLIAM BAYLISS, F.R.S.
Introductory Notes by Sir JAMES BARR, M.D., Dr. C. ROLLESTON, Dr. JANE HAWTHORNE, and "Obscurus."

A few press opinions of the 1st Edition:
MEDICAL TIMES.—"The book is unique and marks a new era."
THE LANCET.—"Much of the evidence contained in the book is quite unobtainable elsewhere."
Sir Archdall Reid in NATURE.—"Some such book as this had to be written, and this is very well written."
MED. REV.—"Should be read by all interested in racial welfare." This book is the first manual on the subject, and is packed with both helpful and interesting matter and much that is new and noteworthy.
London: John Bale, Sons & Danielsson, Limited,
83-91, Great Titchfield-street, Oxford-street, W. 1.

BY KENNETH M. WALKER, F.R.C.S.
M.A., M.B., B.C.

DISEASES OF THE MALE ORGANS OF GENERATION.
Pp. 246. Coloured Plate and 78 Illustrations. 12s. 6d. net.
THE ENLARGED PROSTATE.
Pp. 212. Coloured Plate and 59 Illustrations. 12s. 6d. net.
Oxford University Press, Amen House, London, E.C.4.

LECTURES ON GONORRHŒA IN WOMEN AND CHILDREN.
By J. JOHNSTON ABRAHAM, C.B.E., D.S.O., M.A., M.D. (Dub.), F.R.C.S. (Eng.).
Crown 8vo. Illustrated. 7s. 6d. net.
Brit. Jnl Surg.:—"This book supplies a long-felt want, and should be of considerable value to those interested in this particular line of work."
Wm. Heinemann (Medical Books) Ltd.,
20, Bedford-street, London, W.C.2.

NOW READY. 4/6 net.
THE TREATMENT OF
CHRONIC DEAFNESS.
BY THE ELECTROPHONOÏDE METHOD OF ZUND-BURGUET.
By GEORGE C. CATHCART, M.A., M.D.,
Consulting Surgeon to the Throat Hospital, Golden-square.
Oxford University Press, Amen House, London, E.C.4.

ON THE BREAST.
By DUNCAN C. L. FITZWILLIAMS, C.M.G., M.D., Ch.M., F.R.C.S. Ed. and Eng.
Royal 8vo. 456 pp. 2 Plates, 166 Illustrations. 30s. net.
LANCET.—"The book is packed with accurate clinical observations and bears evidence throughout of extensive clinical experience and wide reading on the part of the author."
Wm. Heinemann (Medical Books) Ltd., 20, Bedford-street, London, W.C.2.

FIFTH EDITION. Pp. v. + 251. With Coloured Plate and 98 other Illustrations. Price 8s. 6d. Postage 6d.
REFRACTION OF THE EYE.
By ERNEST CLARKE, C.V.O., M.D., F.R.C.S.
"One of the best if not the best book on the subject in this or any other language."—EDINBURGH MEDICAL JOURNAL.
Baillière, Tindall & Cox, 7 & 8, Henrietta-st., Covent Garden, W.C.2.

BY IVO GEIKIE COBB, M.D., M.R.C.S.

THE ORGANS OF INTERNAL SECRETION:
Their Diseases and Therapeutic Application.
"Admirably serves the purpose for which it is intended."—LANCET.
Third Edition. Crown 8vo. Pp. xvi. + 352. Price 10s. 6d. Postage 6d.

A MANUAL OF NEURASTHENIA. (NERVOUS EXHAUSTION.)
"This book is written on sound, practical lines."
—BRITISH MEDICAL JOURNAL.
Demy 8vo. Pp. xvi. + 366. Price 7s. 6d. Postage 6d.

AIDS TO ORGANOTHERAPY.
"It comprises all that a beginner need know."
—MEDICAL PRESS AND CIRCULAR.
Fscap. 8vo. Pp. viii. + 183. Price 5s. Postage 3d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-st., London, W.C. 2.

OPHTHALMIC SURGERY
including the Author's
OPERATION FOR IMMATURE CATARACT.
By V. NESFIELD, F.R.C.S. Eng., Major I.M.S. (retired),
Ophthalmic Surgeon, The Queen's Hospital for Children, London, E.
Demy 8vo, with illustrations. 9s., postage 6d.
H. K. Lewis & Co. Ltd., 28 Gower Place, W.C. 1.

CANCER OF THE BREAST
AND ITS TREATMENT.
By W. SAMPSON HANDLEY, M.S., M.D. Lond., F.R.C.S. Eng.
Second Revised Edition. With 82 Illustrations. 30s. net.
Published for the Middlesex Hosp. Press by John Murray, London.

NEURITIS AND NEURALGIA.
By
WILFRED HARRIS, M.D., F.R.C.P.,
Senior Physician to St. Mary's Hospital, and to the Hospital for Epilepsy and Paralysis, Maida Vale.
Cloth. Demy 8vo. 436 pages. Illustrated. Price 12s. 6d. net.
Oxford University Press, Amen House, London, E.C.4.

Just Issued **McLESTER'S NUTRITION AND DIET** *Entirely New*

TWO chief factors should govern all dietary regulations: first, the person's nutritive needs, whether in health or disease, and in disease, the nature of the physiological disturbance; second, the combined experience of the past. The former is too often neglected, and the latter, as a rule, has been given undue weight. In this book the endeavour has been to balance these two—to base dietary rules on nutritional requirement, and to arrange the details according to the knowledge obtained from experience. Many oft-quoted regimens which have the sanction of long tradition have been omitted, because on critical scrutiny it is apparent that they are without value. The space thus saved is given to a consideration of pathology. The general practitioner will find this book a sure guide to proper dietetic management in health and disease.

By JAMES McLESTER, M.D., Professor of Medicine at the University of Alabama. Octavo of 783 pages. Cloth, 36s. net

Send for Saunders' Illustrated Catalogue.

W. B. SAUNDERS COMPANY Ltd. 9, Henrietta Street. LONDON, W.C. 2

YATREN-CASEIN

Indications :

Affections of Muscles and Joints
Febrile Abortion and Sepsis
Inflammations of the Female Pelvis
Grippe- and Broncho-Pneumonia
Bronchitis and Bronchiectasis
Iritis and Iridocyclitis

Special Advantages :

Mild Focal Reactions
No General Reactions
Intensified Action
Easy Dosage
Constant Composition
Sure Sterility

Commercial Packings :
Yatren Casein weak and strong.
Original-box, containing 6 ampoules of 1 c.c.
" " " 6 " " 5 "
" " " 25 " " 1 "
Bottles containing 25 c.c.

BEHRING-INSTITUTE MARBURG-LAHN,
GERMANY.

London: W. Bredt, 41, Great Tower Street, E.C.3.
Singapore: Pearman and Jenkins, P.O.Box 301.
Capetown: F. E. Richardson & Co., Ltd., P.O. Box 2963
Calcutta: J. Mayr, 7, Pollock Street.
Melbourne: A. P. Drug Comp., York House, 294-298, Little Collins Street.

VALENTINE'S MEAT-JUICE

The **Power** of **Valentine's Meat-Juice** to be **Retained,** to **Aid Digestion,** and to **Sustain** and **Strengthen** when **Other Food Fails** has been **Demonstrated** by **Hospital Physicians** and **General Practitioners.**

Pneumonia and Influenza

William H. Peters, M. D., *Admitting Physician Camp for Consumptives, State of Rhode Island, Providence, R. I.:* "VALENTINE'S MEAT-JUICE was the only nourishment retained by my five-year-old daughter during an attack of Pneumonia. She is still taking it and gaining strength. I consider that it saved her life and believe it to be the best product of its kind on the market."

Cavalier Dr. Enrico Ballerini, *Late Surgeon to the Hospital of Rome, Italy:* "I have used VALENTINE'S MEAT-JUICE in the treatment of patients and also personally after having been very ill with Influenza, and I must say it is an excellent tonic in conditions of great organic weakness. It is also very agreeable. I have prescribed it with the greatest satisfaction for convalescents and invalids restricted to a liquid diet."

For Sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY
Richmond, Virginia, U. S. A.

A-12

VALENTINE'S PREPARATION
NUTRIO
VOLUME 1 4/5 OZ.
MEAT JUICE
The result of an Original Process of preparing Meat and extracting its Juice by which the elements of nutrition are retained in a State ready for immediate absorption.
DIRECTIONS. Dissolve one teaspoonful of the Preparation in three tablespoonfuls of cold or warm water; boiling water changes the character of the preparation.

THE LANCET

No. 5447. LONDON, SATURDAY, JANUARY 21, 1928. CCXIV.

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

CLINICAL ADDRESS on Pernicious Anæmia. By Lord DAWSON 115

AN ADDRESS on the Education of Medical Officers for Service in the Tropics. By ANDREW BALFOUR, M.D., F.R.C.P. II. Tropical Hygiene 117

ORIGINAL ARTICLES.

Fractures of the Long Bones. By C. H. FAGGE, F.R.C.S. 122

Serum Treatment of Scarlet Fever. By J. A. SCOTT, M.D., D.P.H. 124

Minor Tuberculosis. By E. WARD, M.D., F.R.C.S... 125

Bacillary Dysentery in Smethwick. By A. G. MILLOTT SEVERN, M.D., D.P.H., and EWART W. EVANS, M.R.C.S. 126

Intravenous and Intramuscular Inoculations of Novasurol in Rabbits. By P. LAZARUS-BARLOW, M.D. 127

CLINICAL AND LABORATORY NOTES.

Auricular Fibrillation Complicating Sepsis in the Puerperium. By JAMES A. KERR, M.B., D.P.H.—(*Illustrated*) 128

Nerve Palsy. By NATHAN WALSH, M.B., Ch.B.... 129

Cystic Pneumatosis of the Bowel. By J. SILVERSTONE, M.B., M.R.C.S... 129

MEDICAL SOCIETIES.

Royal Society of Medicine: Combined Sections of Laryngology, Medicine, and Odontology 130

Reception at the Royal Society of Medicine.. .. 132

Society of British Neurological Surgeons..... 133

Hunterian Society 134

REVIEWS AND NOTICES OF BOOKS.

Emergencies of a General Practice. By the late Nathan Clark Morse, A.B., M.D. Revised by A. W. Colcord, M.D..... 135

Lehrbuch der Enzyme. By Prof. Carl Oppenheimer 136

Mosquito Surveys. By Malcolm E. MacGregor.. 136

Guide to the Anophelines of Tropical and South Africa. By Alwen M. Evans, M.Sc. 136

X Ray and Radium in the Treatment of Diseases of the Skin. By Prof. G. M. Mackee M.D. 136

Lehrbuch der Speziellen Pathologie und Therapie der inneren Krankheiten. By Prof. Dr. A. Strümpell. Revised by Prof. Dr. C. Seyfarth..... 137

Aids to the Diagnosis and Treatment of Diseases in Children. By the late John McCaw, M.D. Revised by F. M. B. Allen, M.D. 137

Feeding and the Nutritional Disorders in Infancy and Childhood. By Prof. J. H. Hess, M.D. 137

A Text-Book of Therapeutics. By Prof. A. A. Stevens, A.M., M.D.... 137

Text-Book of Bacteriology. By Prof. W. W. Ford, M.D. 138

Galatea or the Future of Darwinism. By W. Russell Brain, M.D..... 138

Archimedes or the Future of Physics. By L. L. Whyte 138

British Journal of Children's Diseases 138

LEADING ARTICLES.

DEATH CERTIFICATION 139

A YEAR'S EXPERIENCE OF DENTAL BENEFIT 140

A FAMOUS MEDICAL JOURNAL 140

ANNOTATIONS.

Vital Statistics for 1927 .. 141

After the Flood 142

Sir Mackenzie Chalmers .. 142

Professional Secrecy 142

Atrophy from Disuse 143

Crystallised Tuberculin .. 143

Typhoid Fever in Children 143

The Uses of Ephedrine .. 144

The Prevention of Peritoneal Adhesions 144

A Portable Basal Metabolism Apparatus 145

A Tuberculosis Survey Among School-children 145

Cancer of the Uterus..... 145

Somatic Changes in Mental Disease 146

OBITUARY.

Frederick Gordon Brown, M.R.C.S., L.S.A. 161

MODERN TECHNIQUE IN TREATMENT.

CCLIX.—Treatment of Minor Degrees of Nasal Obstruction. I. Deflections of Septum and Abnormalities of Turbinate Bones. By PHILIP JORY, F.R.C.S. 147

SPECIAL ARTICLES.

Report on Estimation of Vitamin A in Cod-liver Oil 148

Fat-soluble Vitamins A and D in Cod-liver oil. By J. L. L. CLARE and K. M. SOAMES 150

Medicine and the Law: Fishing Vessels and Dangerous Drugs 152

Cancer of the Rectum.... 152

Vienna: Austrian Health Statistics 153

PUBLIC HEALTH SERVICES.

Coördination of the Public Health Services 154

The Registrar-General's Weekly Return 154

Infectious Disease in England and Wales 155

CORRESPONDENCE.

Commissions in the R.A.M.C. (Col. J. Griffiths) 155

The Present Position of the Voluntary Hospital (Dr. E. Graham Little, M.P.) 156

Nomenclature of Disease (Dr. E. Ward) 156

Gastro-Duodenal Ulceration (Prof. Hugh MacLean, Dr. Isaac Jones, Dr. Geoffrey Fildes) 157

Hydnocarpates and Iodides in Leprosy (Dr. James Hasson) 158

Gonorrhœal Urethritis in Male Children (Dr. K. Turner) 158

Facial Lupus (Dr. T. W. T. Dillon) 158

Nervous Instability and the Intake of Sugar (Dr. M. Lawrie) 158

An Operation for the Alleviation of Deafness (Mr. Macleod Yearsley, Mr. T. Jefferson Faulder, and Mr. Claud Woakes). 158

Fatality-rates of Small-pox in the Vaccinated and Unvaccinated (Prof. F. E. Wynne) 159

Oral Administration of Insulin (Dr. F. W. Fornet) 159

The Treatment of the Malarias (Drs. P. Manson-Bahr and V. S. Hodson) 160

Recurrent Colds (Dr. F. R. Walters) 160

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps. — Royal Air Force. — Indian Medical Service.—Deaths in the Services 161

MEDICAL NEWS.

Royal College of Surgeons of England 161

Royal College of Physicians of Edinburgh 161

University of Sheffield ... 161

University of Liverpool .. 161

Prevention of Industrial Accidents 161

University of London: University College 162

University of Manchester . 162

Brighton Hospitals and Rates 155

Research on Common Cold 162

Suppression of Quackery.. 162

Post-graduate Study, Berlin 162

Central Association for Mental Welfare 162

Royal National Orthopædic Hospital 162

Amalgamation of Wolverhampton Hospitals 162

Fellowship of Med. and Post-Grad. Med. Assoc. . 162

Presentation to a Medical Man 162

Liverpool Hospital for Diseases of the Heart .. 162

Importation of Synthalin.. 162

NOTES, COMMENTS, AND ABSTRACTS.

Palæopathology and Evolution. By J. C. M. GIVEN, M.D., F.G.S..... 164

Prison Breakers..... 166

A New Medical Journal in India 166

Honours to Mental Nurses 166

A Book of Days 166

New Preparations: "Wellcome" Antipneumococcus Serum, Type I.—Bismogenol 166

Medical Diary 162

Appointments—Vacancies. 163

Births, Marriages, Deaths . 163

J. & A. CHURCHILL

13th ED. 48 Plates. 92 Text-figures. **28s.**, postage 1s.

TAYLOR & POULTON'S MEDICINE

Sections of Neurology by C. P. SYMONDS, M.D., and on Skin by H. W. BARBER, M.B., F.R.C.P.

"No text-book of medicine is quite so comprehensive as 'Taylor's,' and none deserves a greater popularity."
—BIRMINGHAM MEDICAL REVIEW.

5th ED. 21 Plates, 20 in Colour, 343 Text-figures. **19s.**, postage 9d.

PARSONS' Diseases of the EYE

"There is no text-book of its size which comprises such a rich and clearly arranged detail in Ophthalmology, together with other sciences which bear upon it."
—BRITISH JOUR. OF OPHTHALMOLOGY.

By **HENRY JELLETT**, M.D., F.R.C.P.I., Late Master, Rotunda Hospital, Dublin.

5th ED. 318 Illus. 10 Col. Plates. **18s.**, postage 9d.

A SHORT PRACTICE OF GYNÆCOLOGY

5th ED. 417 Illus. 15 Col. Plates. **25s.**, postage 9d.

A PRACTICE OF GYNÆCOLOGY

"Completeness and up-to-dateness are the main impressions which this edition leaves upon us, and the book can be recommended as an admirable text-book on the subject. We offer our congratulations to the author and to the publishers."
—THE BRITISH MEDICAL JOURNAL.

9th ED. 263 Text-figs. 4 Col. Plates. **18s.**, postage 9d.

A SHORT PRACTICE OF MIDWIFERY

7th ED. 175 Illus. 6 Plates. **8s. 6d.**, postage 6d.

MIDWIFERY FOR NURSES

London: J. & A. CHURCHILL, 40, Gloucester Place, Portman Square, W.1

OXFORD MEDICAL PUBLICATIONS

Telegrams: OXUNIPRES, CENT, LONDON.
Telephone: CITY 8960. Extension, Dept. R.

1927-28

THE SURGICAL TREATMENT OF MALIGNANT DISEASES

By Sir HOLBURT J. WARING, M.S., M.B., B.Sc.(Lond.), F.R.C.S.

Pp. 687. 277 Illus. 19 Col. Plates. 50s. net.

* * * * * * *

ABDOMINAL SURGERY OF CHILDREN

By L. E. BARRINGTON-WARD, Ch.M., F.R.C.S. (Edin.) F.R.C.S. (Eng.)

Pp. 300. 82 Illus. 3 Col. Plates. 15s. net.

* * * * * * *

DISEASES OF THE GUMS AND ORAL MUCOUS MEMBRANE

By Sir KENNETH GOADBY, K.B.E., M.R.C.S., L.R.C.P., D.P.H. (Cantab.)

New (3rd) Edition. Pp 428. 10 Col. Plates. 118 Figs. 3 Tables. 42s. net.

* * * * * * *

BACTERIOLOGY AND SURGERY OF CHRONIC ARTHRITIS AND RHEUMATISM With End-Results of Treatment

By H. WARREN CROWE, D.M., B.Ch.(Oxon.), M.R.C.S., L.R.C.P.

The Chapter on Surgical Treatment by HERBERT FRANKLING, C.B.E., M.R.C.S. (Eng.)

Pp. 197. 6 Col. Plates. 34 Illus. 4 Charts. 30s. net.

* * * * * * *

DIAGNOSIS AND TREATMENT IN DISEASES OF THE LUNGS

By FRANK E. TYLECOTE, M.D., D.P.H. (Vict.), F.R.C.P. (Lond.);
and GEORGE FLETCHER, M.A., M.D.(Glas.), M.R.C.P. (Lond.), D.P.H.(Camb.),

Pp. 270. 7s. 6d. net.

* * * * * * *

POST-MORTEM APPEARANCES

By J. M. ROSS, M.D., B.S. (Lond.), M.R.C.S., L.R.C.P.

With a Preface by E. H. KETTLE, M.D.

New (2nd) Edition. Pp. 234.

7s. 6d. net.

Catalogue Free ***Upon Application.***

The Oxford University Press

HUMPHREY MILFORD. Dept. R. (L.), Falcon Square, London, E.C.1

(And of all Booksellers).

Clinical Address
ON
PERNICIOUS ANÆMIA.*

BY LORD DAWSON OF PENN.

THE conception of pernicious anæmia is interesting from the way it has grown and from the problems it provokes. Interest consists in not only having a past but a future.

Let me recall the landmarks in our knowledge.

Although the first case was reported by Combe,[1] of Edinburgh, in 1822 and in 1851 Barclay [2] noted the glossitis which is an occasional feature, it was Addison [3] in 1855 who gave us the first conception of this disease; and it is worth recording that during its study he "stumbled upon the curious facts" (to use his own words) which led to his discovery of Morbus Addisonii. He described the clinical picture; the insidious onset; the occurrence in both sexes beyond middle life, the body as "blanched, smooth and waxy" and "flabby rather than wasted"; the breathlessness and palpitations; the progressive langour and prostration, and the continuance, in spite of all remedial efforts, to a fatal termination. He recognised the disease as something apart and without discoverable cause, and termed it "idiopathic" to make a distinction from cases presenting "the usual causes and concomitants of the anæmic state." The remarkable remissions seem to have passed unnoticed, but when one reflects how far off are those days and how primitive were the then methods of blood examination, one thinks with admiration of the clinical acumen which Addison's description discloses. And when it is further recalled that 17 years later Biermer [4] described the disease yet failed to distinguish it from certain other grave anæmias, it seems only just that one of its titles should be "Addison's anæmia."

OBSERVATIONS AND THEORIES.

The next link was forged in 1876 by Cohnheim,[5] who described megaloblastic degeneration of the bone-marrow as the cause of the disease; that is, he held that the bone-marrow failed in its function of the production of blood—hence the anæmia.

Of the associated conditions atrophy of the gastric mucous membrane was noted by Fenwick [6] in 1877, degeneration of the posterior columns by Leichtenstern [7] in 1884, and achlorhydria by von Noorden [8] in 1891. Next came Ehrlich,[9] who held that the megaloblastic changes in the marrow were regenerative and compensatory to blood destruction, thus raising with Cohnheim the issue, which yet remains unsettled, whether the changes in the marrow are degenerative or regenerative—under-production or compensatory over-production.

In 1900 the work of Hunter [10] brought out the important part played by septic teeth. Secondly, he made gravimetric estimations of the hæmosiderin in the liver, showing that in amount it far exceeded that found in any secondary anæmia, and postulated hæmolysis in the portal veins. Further, he emphasised that the disease is not merely an affection of the blood, but is characterised by features such as glossitis, achlorhydria, diarrhœa, and degeneration of the spinal cord, some of which may precede the anæmia.

Hunter espoused the view of Ehrlich as opposed to that of Cohnheim—namely, that the changes observed in the marrow are regenerative and intended to compensate for hæmolysis produced by bacterial toxins. That hæmolysis on a considerable scale does take place in pernicious anæmia is suggested by the intense prussian-blue reactions in spleen, liver, kidneys, lymphatic glands, and synovial membranes. Further support for this view is found in the excess of bilirubin in the plasma, and of urobilin in the urine and fæces. I stress this evidence because recent original work (Zadek,[11] Peabody [12]) has led its authors towards the conclusion that the anæmia owes its existence to defective blood-formation in the marrow, thus reverting to the view that Cohnheim put forward in 1876. The two opinions might be reconciled—and they are both based on careful observations—by assuming that the blood turned out by the marrow is so abnormal as to be an easy prey to destruction.

After Hunter's work in 1900 we come to the demonstration of reticulocytes, by Cesaris-Demel [13] and Chauffard [14] in 1907, by vital staining. If a blood film is treated with brilliant cresyl blue before the use of a fixative a network can be shown in the cytoplasm of the red cells. This network has been demonstrated by Sabin [15] in the earliest red cells of the chick embryo at a time when they are still nucleated and is to be considered a cytoplasmic substance. It disintegrates and disappears as the cell becomes mature. The reticulocytes, therefore, afford a criterion of youth, and their number in a blood preparation is an index of the activity of normal blood regeneration. Thus whereas, in films of normal blood, reticulocytes may be present to the extent of, say, 1·5 per cent., in active blood formation they may reach 15 to 30 per cent.

ORIGIN AND ABNORMALITIES OF RED CORPUSCLES.

Here I must step aside for the purpose of clarity and consider certain happenings in the rise and fall of the red blood cell. My digression must be brief and controlled or we shall become submerged in the morass of the higher hæmatology.

In the embryo there appear blood islets, some in the yolk-sac and others in the primitive liver. These are aggregations of cells of which those that are centrally placed become primary blood cells (hæmocytoblasts) and those that are peripherally placed become an endothelial envelope which is the first manifestation of the reticulo-endothelial system. These primitive blood cells take on the function of carrying hæmoglobin and become primitive erythroblasts. The latter in turn become large cells, some of which remain nucleated and are called megaloblasts, whilst others lose their nuclei and become megalocytes. These forms belong only to the blood of the fœtus and are not found in post-natal life either in blood or marrow, except in pathological states like that of pernicious anæmia. In postnatal life the primitive erythroblasts are derived from the reticulo-endothelium, proliferating from the endothelial cells of the capillaries of the marrow. From these arise the normoblasts which lose their nuclei and ultimately become the normal red cell.

Punctate basophilia is an abnormal change in a young red cell and therefore does not appear in the normal development of blood (Ferrata [16]). Polychromatophilia is likewise evidence of immaturity of the red cell and is a normal stage in the regeneration of blood. Anisocytosis is to be regarded as evidence of hurried regeneration, and is not a strictly normal phenomenon. Poikilocytosis is never seen in health and should be looked on as a more definitely abnormal mode of regeneration than is anisocytosis. Lastly we come to megalocytosis, which is an important characteristic of pernicious anæmia and may be regarded as *the* most important diagnostic feature in the blood picture. It can be demonstrated by two methods, the first being the extreme variation from normal as shown by Price Jones [17] in his skilled and laborious technique for measuring the diameter of the red cells, and the second being the increased average volume of the red blood cell as Alder [18] showed by a viscosimetric method. Megalocytosis accounts for a colour-index above unity, for since the normal red cell is already saturated with hæmoglobin, only a larger cell can contain more. The exact mode of production of the megalocyte is disputed: it is most probably a direct derivative of the megaloblast.

The megaloblast, though found widely distributed throughout the hæmatopoietic tissues of the fœtus, is

* Based on communications made to the Brighton and Sussex Medico-Chirurgical Society and the Windsor and District Medical Society.

absent in those of the normal adult. However, in certain severe anæmias a reversion to this fœtal type occurs, and one of the most characteristic findings in pernicious anæmia is a megaloblastic activity of bone-marrow, spleen, and liver, with the occasional escape of megaloblasts into the blood. The bone-marrow in pernicious anæmia has been studied in life by trephining the tibia, and Zadek and Peabody have shown that during relapses there is an active proliferation of megaloblasts, which so increase and multiply as to occupy much of the available bone space, the fat cells collapsing and their contained fat disappearing. At the same time a few normoblasts and red cells are found, from which we may infer that the megaloblastic proliferation seems to serve an unknown and feeble physiological purpose; perhaps an abnormal need calls forth an abnormal effort. On the other hand, with a remission the megaloblasts in the marrow more or less disappear and a preparation shows normoblasts and mature red cells less closely packed and with marrow fat easily discernible. With this change in the marrow picture, and as a sequel to it, the red blood count correspondingly improves.

Taking advantage of the fact that the proportion of reticulocytes is the best criterion of active blood formation, Peabody searched for these immature forms in the blood of pernicious anæmia during a relapse and found that their percentage was not higher than that found in normal blood, which accords with the view that the relapse is the result of diminished blood formation. On the other hand, in anæmias which are admittedly hæmolytic, like that of acholuric jaundice, the reticulocytes reach 20 to 25 per cent., showing that a compensatory blood formation is in active process. These considerations have led our Swiss and American colleagues to conclude that the immediate cause of pernicious anæmia is a defective formation of blood in the marrow, due to the reversion of the cellular content of the marrow to the fœtal megaloblastic type.

Possible Bacterial Cause of Hæmolysis.

Diminished blood formation, however, cannot be the whole story. That there is definite hæmolysis in pernicious anæmia cannot be doubted when one recalls the excess of free iron demonstrable in the liver, spleen, kidney, and even synovial membranes, or the excess of plasma-bilirubin, as demonstrated by the van den Bergh [19] test, and the excess of urobilin in the urine and fæces.

There are grounds for associating bacterial toxins with the cause of this hæmolysis. From time to time a case occurs in which a close connexion with a septic focus can be established; septic teeth can be quoted as an example. The following case suggests the operation of a toxin producing Addison's anæmia.

Some years after an uneventful appendicectomy a young woman had acute intestinal obstruction. At the operation inches of gangrenous ileum were removed. Within two days symptoms of obstruction recurred, and a second operation was performed, involving a second anastomosis. Life was preserved, but ever afterwards intestinal function was impaired; there was distension and liability to constipation and diarrhœa, but she lived her life, though with limitations, and even married. Later she developed signs and symptoms resembling those of pernicious anæmia, and these persisted with remissions to her death. *B. welchii* was recovered in predominance more than once from the intestinal content.

Moench, Kahn, and Torrey [20] in an examination of the stools in 35 cases of pernicious anæmia showed that *Bacillus welchii* gives uniformly higher counts than normal. However, none of the strains they isolated could be shown to be more hæmolytic or pathogenic than *B. welchii* from the stools of normal persons. They consider that this organism comes into play because of its increased numbers and activity at an abnormally high level in the alimentary tract, where absorption is more active. That the cause of the upward spread of colonic organisms is achlorhydria is a view now widely held. Cornell [21] showed that *B. welchii* injected subcutaneously into rabbits caused an anæmia with constant anisocytosis. Kahn and Torrey,[22] working at the same time on the effect of intravenous injection of the toxin in monkeys, obtained very similar blood pictures with high colour indices and leucopenia. According to Gulland [23] these workers have since gone further. Having damaged the gastric mucosa of monkeys and fed them with cultures of *B. welchii* they have produced in the blood and tissues changes identical with those found in pernicious anæmia in the human being.

Constitutional Factors.

There is evidence of other factors at work, especially constitutional factors. Thus achlorhydria, so constant and so often for years a precursor of the disease, has been shown by Hurst [24] to exist in the blood relatives of patients with pernicious anæmia.

In this disease much depends on a patient's reaction. That is why it occurs in some with so little apparent provocation and in others it keeps away in spite of every provocation. The make-up of the individual is important and is illustrated by the proneness of pernicious anæmia to occur in certain families—a proneness which finds an interesting analogy in the incidence of the form of anæmia due to *Dibothriocephalus latus*. In certain regions of Finland, although this tapeworm is common in the human intestine, the anæmia is nevertheless rare. Thus in only a small percentage of the infected did Schauman [25] find the anæmia and amongst these the incidence was largely familial. Further, it is now known that this susceptibility is also racial, for in areas where Finns have brought the parasite to North America, though Americans and Finns alike become infected only Finns (and then only certain families) develop the anæmia, whereas the Americans escape. This bears directly on our conception of the ætiology of pernicious anæmia, for dibothriocephalus anæmia shows a blood picture identical with that of idiopathic pernicious anæmia and is caused by a hæmolytic toxin which can be isolated from the segments of the parasite.

Liver Treatment.

Let us now pass to the treatment of pernicious anæmia by feeding with liver and liver extract. This is based on the results of experiments on dogs by Whipple and Robscheit-Robbins.[26] These demonstrate that fresh liver contains some principle which promotes blood regeneration. It was first applied to cases of pernicious anæmia by Minot, Murphy, and Cohn,[27 28 29] who found that on a diet rich in mammalian liver (about 200 g. cooked weight daily) there was rapid and striking improvement, with prompt increase of the red blood corpuscles in almost every case. About the fifth day the reticulocyte count rose often to 14 per cent., the rise corresponding to a fall in the plasma bilirubin as the result of diminished blood destruction. This was followed by a prompt and steady increase of the red cell count. Thus in 90 cases the average numbers of red cells rose from 1½ to nearly 4½ millions in two months. Other forms of anæmia show striking benefit under the same treatment.

Active extracts of liver are now being used with success. Thus Spence [30] employed a liver extract made by the method of Cohn. He used 20 to 25 g. a day and his cases showed definite improvement after seven days. Another method which avoids the use of raw or cooked liver consists in drying liver in vacuo and powdering it at a low temperature. This powder is easy to take, and two ounces of it correspond to eight ounces of fresh liver substance. We may hope that in the near future the composition of the extract may be determined so that it can be synthetically prepared.

In conclusion, three possible links can be traced in the chain of ætiology: achlorhydria, abnormal flora in the upper half of the alimentary tract, and the absence or insufficiency of a specific function of the liver. What is the interrelation of these factors and the rôle played by each in the causation of the disease remain a matter for the future to decide.

(*References at foot of next page.*)

An Address
ON THE
EDUCATION OF MEDICAL OFFICERS FOR SERVICE IN THE TROPICS.

Delivered at the International Continuation Course of the League of Nations, Nov. 24th, 1927.

By ANDREW BALFOUR, C.B., C.M.G., M.D. Edin., F.R.C.P. Lond. & Edin.,
DIRECTOR, LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE.

Part II.*—TROPICAL HYGIENE.

A story is told of a distinguished sanitarian in the Indian Medical Service. He was given a dinner on the occasion of his retirement, and heartily congratulated on the result of his labours in the cause of tropical hygiene. Replying to the toast of his health, he said that he attributed whatever success had attended his efforts to two factors: first, that he possessed an acute sense of humour; and, second, that he possessed no sense of smell!

If these were indeed requisites for the success of a tropical sanitarian the outlook would, I fear, be gloomy for teachers of tropical hygiene, as one cannot instil a sense of humour where it is lacking, and the production of anosmia would entail rather a serious operation. The colonel was joking, and yet there is no doubt that unless a tropical hygienist has a sense of humour he is likely before very long to become a corpse or a neurasthenic, while it is equally true that at times he wishes his olfactory sense was absent or blunted, though, with all due deference to the jovial colonel, the possession of a good "sanitary nose" is a great asset in public health work. I know of at least one unfortunate who perished from food poisoning owing to the fact that he had lost all sense of smell. However humorous or the reverse the student may be, whatever his powers of smell, one thing is certain, he must have been well grounded in those principles of tropical medicine we have already discussed before he undertakes the study of tropical hygiene. Some people will tell you there is no such thing as tropical hygiene. In one sense this is true enough. The principles governing hygiene in the tropics are those which apply to the hygiene of countries with temperate climates. On the other hand, the application of these principles is often very different in the tropics from their application, say, in Europe. It is in practice, not in principle, that the hygiene of countries in the torrid zone differs from that of those which are termed Occidental.

The practice differs for various reasons. In many cases the conditions are primitive and must be met by what is called field hygiene, partly on account of the environment, partly because there is a paucity of funds. Too often bricks have to be made without straw, and the man blessed with ingenuity finds every scope for it. Again, the populations which have to be served and handled, even if not primitive, are usually devoid both of a sanitary sense and a sanitary conscience, and measures tried and proved amongst educated communities fail lamentably when introduced amongst races which are backward from the hygienic standpoint. Yet, again, there are customs and prejudices, religious and otherwise, which have to be overcome and which may prove insuperable barriers.

Equally important is the fact that the ætiology of the communicable diseases encountered differs in many instances from that of the maladies met with in non-tropical lands, that the rôle of the arthropod is, if not paramount, at least greatly in evidence, and that the climatic conditions usually tend to aggravate all forms of nuisance and of danger to health. These are commonplaces, but they are worth bearing in mind, for any training in tropical hygiene must take cognisance of them, and though, as ever, experience is the best teacher, yet the student can be given some idea of what he has to face and how best he should face it.

Subjects the Student should Study.

In the first place, he must be taught how to look after himself in the tropics, for a blind leader of the blind will not only forfeit respect, but may lead some of his flock astray, and perhaps bring his own career to a sudden and disastrous termination.

Climatology and Acclimatisation.

A course in tropical hygiene should, then, commence with a discourse on climatology, and should briefly and succinctly indicate the physiological and pathological effects of tropical conditions on the life and health both of the indigenous native population and of the white sojourners and settlers. Here, as elsewhere throughout the course, if there be time, it is well to direct attention to what was known on this subject in the olden days when there was no bacteriology or protozoology, and no real medical entomology. A few quotations from a book like Johnson's "Influence of Tropical Climates on European Constitutions" are likely to interest the student and impress upon him the fact that, despite all our new knowledge, the climate of the tropics still remains, as of yore, a menace in the background and cannot be lightly discarded. It is, I think, better to employ the historical perspective in this way throughout, giving point to the subject under discussion, rather than to embark on a disquisition upon the history of tropical hygiene which would take up far too much time, probably weary the majority of the audience, and irritate those of them with severely practical minds who want to get down to what in vulgar English is called "brass tacks," that is to say essentials, essentials both for examination purposes and for their work abroad. In advancing a plea for the intro-

* Part I., Tropical Medicine, appeared in The Lancet of Jan. 14th, p. 63.

Pernicious Anæmia: References.

(*Continued from previous page.*)

1. Combe, J. S.: Trans. Med. Chir. Soc. Edin., May, 1822.
2. Barclay: Med. Times, 1851, xxiii., 480.
3. Addison, T.: On the Constitutional and Local Effects of Disease of the Suprarenal Capsules, London, 1855.
4. Biermer: Korrespondenzblatt für Schweiz. Aerzte, 1872.
5. Cohnheim, I.: Virch. Archiv, 1876, lxviii., 291.
6. Fenwick, S.: The Lancet, 1877, ii., 77.
7. Leichtenstern, O.: Deutsch. med. Woch., 1884, x., 849.
8. von Noorden: Charité Ann., 1891, p. 217.
9. Ehrlich, P.: Verh. des Cong. für. inn. Med., 1892.
10. Hunter, W.: Pernicious Anæmia, London, Charles Griffin, 1900.
11. Zadek, I.: Schweiz. med. Woch., 1921, ii., 1087.
12. Peabody, F. W.: Amer. Jour. Path., 1927, iii., 179.
13. Cesaris-Demel, A.: Folia hæmatol., 1907, iv., Suppl., 1.
14. Chauffard, A.: Semaine méd., 1907, xxvii., 25.
15. Sabin, F. R.: Johns Hopkins Hosp. Bull., 1921, xxxii., 314.
16. Ferrata, A.: Folia hæmatol., 1907, iv., Suppl., 33.
17. Price-Jones, C.: Guy's Hosp. Rep., 1924, lxxiv., 10.
18. Alder, A.: Zeitschr. für klin. Med., 1918, lxxxiii.
19. van den Bergh, A. A. H.: Der Gallenfarbstoff im Blut· Leiden, 1918.
20. Moench, Kahn, and Torrey: Jour. Infect. Dis., 1925, xxxvii., 2.
21. Cornell, B. S.: Ibid., 1925, xxxvi., 508.
22. Kahn, M. C., and Torrey, J. C.: Proc. Soc. Exper. Biol. Med., 1925, xxiii., 8.
23. Gulland, G. L.: Brit. Med. Jour., 1927, ii., 669.
24. Hurst, A. F.: The Lancet, 1923, i., 3.
25. Schauman, O.: Deutsch. med. Woch., 1910, xxxvi., i., 1218.
26. Whipple, G. H., and Robscheit-Robbins, F. S.: Amer. Jour. Phys., 1925, lxxii., 395.
27. Minot, G. R., and Murphy, W. P.: Jour. Amer. Med. Assoc., 1927, lxxxix., 759.
28. Murphy, W. P., Monroe, R. T., and Fitz, R.: Ibid., 1927, lxxxviii., 1211.
29. Cohn, E. J., Minot, G. R., Fulton, J. F., Ulrichs, H. F., Sargent, F. C., Weare, J. H., and Murphy, W. P.: Jour. Biol. Chem., July, 1927.
30. Spence, J. C.: The Lancet, 1927, ii., 1026.

duction of occasional historical references I realise I am advocating rather an ideal type of course for the necessity of imparting a vast deal of important information within a very limited period (a point to which further attention will be paid) may well exclude any such excursions. Yet in the study of hygiene, more perhaps than in the case of any other subject, it is advantageous to let the lessons of history speak for themselves. They are impressive and should engender both faith and hope, showing the student that, even if some of the details he has to master are dry, the collective effects of the knowledge gained and applied by his predecessors has been remarkable and stimulating him to fresh efforts in a good and promising cause.

Not only must the effect of climate on native races be considered but, as must be evident from what has already been said, some attention must be directed to the native races themselves, to their habits, customs, religious prejudices, superstitions, and so forth. It is, of course, impossible to go minutely into such matters. A few striking illustrations should be selected, one, let us say, from pagan negroes, another from Mohammedan Arabs, a third from Hindus and Hinduism, a fourth from the "heathen Chinee." This will suffice for lecture purposes, and the student can supplement what is told him from the literature, as, for example, from "Mother India," that astonishing but well documented record from an American source, or, in due course, from personal experience amongst the people with whom he is brought into contact. Some men can, of course, envisage their future surroundings and possess imagination which helps them to foresee and to cope with difficulties, but others never seem to realise what the future has in store for them, and without some guidance will, on reaching the tropics, feel like fish out of water for quite a lengthy time, during which they may either do very little good or a great deal of harm.

Something, I think, should also be said about handling native races. It is, of course, not easy to formulate a set of rules generally applicable, but there are certain cardinal principles which can and should be enunciated, and will be found of value to the tyro.

The subject of the white man in the tropics is an easier one, though it is a difficult task to deal adequately and to advantage with the vexed question of racial acclimatisation. It must, however, be attempted and a synopsis given of the various views at present held, stress, of course, being laid on those findings which admit of no dubiety. Here some reference must be made to sexual hygiene, for it plays an important part in this acclimatisation question, more especially in connexion with the onset of neurasthenia. Health officers should be alive to this aspect of the problem. A clear differentiation should be drawn between the effect of the dry and of the moist tropics on the comfort and health of the white resident, and attention should be directed to the modifying influence of altitude.

Personal Hygiene.

The subject of personal hygiene may next claim attention, and, while much that is said will apply to the students themselves, the discourse must not be limited to the prophylactic measures they should adopt against climatic effects and the usual trials and dangers which beset white men in the tropics, but must include the care and attention which have to be exercised by non-medical women, and in the case of infants and young children. Here let me say that a very safe guide is the interesting and useful little book compiled by Dr. Balfour Kirk and entitled "Hints on Equipment and Health for Intending Residents in the Tropics." The subjects to be considered under this heading are numerous and varied. The necessity for inoculation against diseases of the so-called enteric group must be emphasised and a definite statement made on the policy of not inoculating infants and young children, the reasons for such exclusion being given. There should be some reference to the advisability or otherwise of submitting to inoculation against plague and cholera. The value of vaccination against small-pox must be affirmed with no uncertain voice, for in the tropics variola is a disease with which one cannot afford to trifle. It must not become the sport of politicians, the plaything of cranks, the theme of the ignorant, even the well-meaning ignorant. Clothing, equipment, both medical and sanitary, the regulation of life and habits in a hot country for all ages and both sexes, must be discussed and special stress should be laid on the value of rest. Not only the care of the body, but the care of the living quarters, including methods for mitigating heat and glare, should be dealt with, from the humble hut to the storied house, and on no account must the lecturer omit the important question of native servants. A little knowledge may be a dangerous thing, and while it may be admitted that to know the curious, often disgusting, and not infrequently dangerous habits of the native servant thoroughly would necessitate donning his pigmented skin and viewing the world through his eyes, "forewarned is forearmed," and the potential risks which the native servant represents should be impressed upon the class in a general way, and illustrated by a few striking examples such as the cholera carrier, the ejector of saliva upon laundry material, the user of the filthy kitchen cloth.

Of equal importance is the matter of the housing of native servants and the need of frequent inspection of their quarters, as well as of the kitchen where the cook and his myrmidons, often masters of their trade, may inadvertently add death to the pot.

Maternity and child welfare is a big subject, but it cannot be omitted, even though only a few of the special difficulties imposed by the tropics can be touched upon and reference made to the placental transmission of such maladies as malaria and ankylostomiasis. Its bearings, both on the white and the indigenous race, must be considered, and, so far as maternity in native races is concerned, this part of the course will link up with the first lecture, for native habits and customs very often play a paramount part in the hygiene of pregnancy, childbirth, and the puerperium. Similarly the question of child welfare, both amongst the white and coloured sections of a tropical population, is intimately associated with that of food and dietetics which we are fast approaching.

Housing.

Housing in the tropics may, however, with advantage be first considered if only because it will embrace markets where food is housed or stored. There can be no doubt that housing is one of the most important topics in our ideal course. Anyone who has, as I have, seen a tropical country redeemed from barbarism and the early efforts of a white race to obtain a footing in it, will admit that hygienic measures are comparatively futile until decent houses are provided. For example, the morbidity and mortality amongst British officers in the Bahr-el-Ghazal Province of the Anglo-Egyptian Sudan were lamentably high until more or less settled conditions were forthcoming and they were able to occupy houses giving a measurable degree of comfort and protection.

In the case of native races also housing plays a prominent part. This has been specially recognised in Kenya Colony where, again and again, the director of the medical department and the chief sanitation officer have emphasised the need of revolutionising native housing if disease generally, and notably plague, is to be mastered. The Dutch in the East Indies have not only recognised this need but have gone a long way to meet it. The whole subject can be made very interesting, as well as instructive, if properly handled, and the lecturer should indicate the good points in native housing methods where these exist, as they do exist, and caution would-be reformers against misdirected zeal. In the case of European houses the question of screening against flies and mosquitoes will come up for consideration, and, in my opinion at least, the students should be

warned to discount the statements of old stagers in certain tropical countries to the effect that white men and women cannot live in screened houses owing to their stuffiness and the feeling they engender of being "cribbed, cabined, and confined." It is not a question of stuffiness but of stuff and nonsense in many instances and, even where, in sheltered areas, screening may make a house somewhat close, the advantages far outweigh the disadvantages. Partial screening versus total screening demands consideration, and here not only the screened verandah but the verandah as a verandah may suitably form the subject of discourse. In other words, should tropical houses be furnished with verandahs? One can understand the director of a public works department jibbing at expense and becoming an opponent of verandahs, but it is strange to find medical officers decrying their need and value. Possibly some of the opposition is due to the fact that so many verandahs are wrongly constructed. How rarely are they properly ventilated! An unventilated verandah often permits of a cushion of hot air lying up against the protected side of the house and so in part defeats its own ends. Given adequate ventilation, a verandah is an essential part of a tropical residence, and the prospective health officer should be duly apprised of that fact.

Year by year hygiene in the tropics approximates more closely to that of temperate climates. In fact, in large tropical cities many aspects of public health, especially those related to sanitary engineering, do not greatly differ from those which present themselves in urban areas in Europe and the United States. Hence, when teaching tropical hygiene here, it is of great importance to give students every opportunity of visiting works and plants concerned with the public health from which useful and practical lessons can be drawn.

So far as housing is concerned, should anything be done in this direction? I think not. True, if there were ample time it might be advantageous to have a look at bungalow construction and to familiarise the student with certain aspects of house construction, but these are matters affecting rather the engineer and the sanitary inspector, and, if the future health officer gets a clear grasp of the principles underlying house construction in the tropics, it should be sufficient for his purpose. His function in this connexion will be, as a rule, advisory, not executive.

Under the heading of housing, however, come such buildings as markets, slaughter-houses, hospitals, schools, prisons, and factories. If it can be arranged, visits should be paid to all or some of these, the most modern and up to date being chosen for the purpose. The most important are, I think, markets, slaughter-houses, and prisons, for the health officer in the tropics is constantly concerned with questions having a bearing on buildings constructed or to be constructed for these three purposes.

While, as a rule, markets and slaughter-houses in the tropics are, even when primitive, built on reasonable and sensible lines, this is often far from being the case with prisons. I think I have only once seen in the British tropics a prison built on lines corresponding to those followed in this country and which certainly possess some advantages from the hygienic if not from the economic standpoint.

Hospital and school construction is perhaps best studied from plans of good types already existing in the tropics, and of these there is now no scarcity, though they are not always easy to obtain. The housing of native labour is a matter requiring very careful attention, and students should be told what has been done at the mines on the Rand, in Natal, in the Panama Canal Zone, and elsewhere. A book like Pearson and Mouchet's "Hygiene of Native Compounds" is of great value and leads me to say something on the subject of camps.

Although, as indicated, the health officer destined for the tropics should be given an opportunity of becoming practically familiar with various developments in public health and sanitary engineering in a country blessed with a temperate climate and possessing the doubtful benefits of civilisation, he should at the same time gain instruction, if possible, in *field hygiene*, those comparatively rough-and-ready methods, those shifts and improvisations, as well as those special adaptations which are usually a feature of army sanitation during active service. For this purpose, here in London, we are in the habit of sending our students for a day to the Army School of Hygiene at Aldershot, where the field demonstration and museum afford excellent practical instruction in everything pertaining to camp hygiene and that of an army in the field.

I cannot leave the subject of housing without a brief reference to *town planning*. Something should be said about the latter, if only to enlist the student on the side of those who deplore the mistakes of the past, seek to guard against their repetition, and to remedy them as far as may be. The expert town-planner is a specialist, but every health officer in the tropics should be a sturdy advocate of town planning along sound lines and, in the future, more than in the past, his opinion is likely to be sought in the laying-out and reconditioning of townships.

Food and Dietetics.

Food and dietetics together form one of the most important sections of the course. Many lectures might well be devoted to it, but even a limited survey can be made informative. One has again to deal, in the main, with general principles, but it is, of course, advisable to devote special attention to food deficiency and its relation to such diseases as beri-beri, scurvy, and pellagra. Some of the commoner tropical foodstuffs, more particularly those fruits (bananas) and cereals (maize and millet) which form the staple dietary of some native races, will be considered, as will the use and abuse of condiments. Milk and its products require special attention for, complicated as the milk question is in a country like England, it is still more complicated, at least in certain directions in, let us say, India, while, in the tropics generally, the cow is not the almost universal provider of lacteal fluid that she is in this and many other lands. If, as Cicero said, we are "possessed with thoughts of the kitchen," and our students are, like Horace's youth, devoted to kitchen studies, such thoughts and studies must not be limited to what is prepared and cooked in the kitchen. Far from it, for the hygiene of food in the tropics is a matter to which special attention must be paid. Hence the lecturer must deal with the handling and inspection of food, its preparation, its storage and preservation with a dissertation on cold storage. He must refer to tinned and bottled foods, a subject which will lead him on to food poisoning and its association with kitchen hygiene and man's enemy, the fly. The hygiene of milk, of aerated waters, and of ice possesses no little importance, and students should certainly be taken to see a pasteurising plant and, if possible, should visit both a bad and a good aerated water factory. If only one of these is available I should say "go to the bad," for it will teach more and better lessons than the up-to-date place and, in any case, there are few localities in the tropics where modern and elaborate plants are or can be installed.

Water and Water-supplies.

We now come to the great subject of water and water-supplies, and this perforce must, for the most part, be handled along lines familiar in all courses on hygiene, under such headings as sources of supply, classification of waters, sources of pollution, collection, protection and storage, distribution and purification. In addition, the relative values of bacteriological and of chemical analyses must be discussed and, so far as bacteriology is concerned, the suitability or otherwise for tropical work of the methods and standards adopted for use in temperate climates requires consideration.

Stress should be laid on the special value in the tropics of a careful personal inspection of the source of supply and of its surroundings, a form of examina-

tion at least as important as any laboratory procedure, and in certain circumstances much more important. Another matter which must be impressed upon the student is the absolute necessity for making adequate provision for the removal of waste water before introducing an ample water-supply into any settlement. This possesses an unwonted significance in the tropics, as neglect to secure proper drainage is likely to be followed by retribution in the shape of mosquitoes and malaria. When the problems of purification are being expounded it should be remembered that mechanical filters and chlorination now play a great part in water hygiene in the tropics, and every effort should be made to enable the students to see for themselves rapid filtration and chlorination in actual operation. More primitive methods of purification of water, or of securing a satisfactory supply, under discouraging conditions, both on a small and a large scale, should be indicated and, naturally, wells, both shallow and deep, will claim a fair share of attention. A student who cannot explain how a shallow well can be effectually protected from pollution, and how, if polluted, its contents should be treated, is certainly not a satisfactory class product.

"Conservancy."

Under the general title "conservancy," the collection, removal, and disposal of both excreta and refuse fall to be considered, and it is often convenient to deal here also with sullage water and surface drainage. Mrs. Humphry Ward, the novelist, in the person of one of her characters, once said: "In my youth people talked about Ruskin, now they talk about drains." Drains, however, need not occupy much of the time of our lecturer on tropical hygiene, because in most parts of the tropics they do not exist. True he must say something about them, but he is much more concerned with simple sanitary appliances, and the pail unhappily bulks more largely in hot countries than the drain or sewer. I remember Dr. Cameron Blair, of Nigeria, an able and experienced health officer of the Colonial Medical Service, once saying to me that, for the prospective M.O.H. in the tropics one might do worse than recommend the study of Vivian Poore's "Essays on Rural Hygiene." Accordingly the student may be introduced to the subject in the following terms:—

"The indiscriminate scattering of human ordure on the surface soil is distinctly a more dangerous and offensive procedure in hot than in cold or temperate countries. For one thing, the deposits are much more likely to be infected, whether with the ova and larvæ of helminths, the cysts of *Entamœba histolytica*, the causative factors of diarrhœa, or the bacilli of enterica, dysentery, or cholera. For another, such virus-distributing agents as flies and dust are much more in evidence, while the habits of many native populations—for example, the way in which they go about barefoot, their methods of feeding and preparation of food, their disregard for general cleanliness—facilitate the transmission of disease. Yet again, in hot, moist climates at least, decomposition rapidly occurs, and though eventually it has the effect of rendering the excreta harmless they become at first, if in any bulk, exceedingly malodorous.

"The same is true in some respects when urine is voided in any quantity on the ground, and hence it is of the greatest importance to prevent soil pollution in the tropics."[1]

He will then be instructed as to latrines without receptacles and the ancient precepts and practice of Moses, first of known hygienists, and he will be told how methods must differ according to local conditions, for what is fit and proper in the Sudan is the very reverse in British Guiana. The danger of flies must be dinned into him, and the means of circumventing *Musca domestica* and its congeners in ways, some of which are the outcome of the Great War, fully detailed. Latrines, both private and public, with receptacles; complications introduced by the necessities of travel; native requirements, varying with creed and country; urinals of different kinds, all these somewhat unsavoury but essential matters require attention, and happy the lecturer who can impart a little chaste humour into the dry systems of conservancy. I think it must cheer and encourage a student to know that, during the war, an unlucky wight was seen with his ear close to the upper end of a funnel urinal which, in his ignorance and simplicity, he had mistaken for a listening post!

Incineration.

Methods of removal and disposal need not detain us beyond a reference to incinerators and the process of incineration. Too enthusiastic an advocacy of incineration will probably cause the lecturer to be dubbed an Ananias by one of his ex-students trying desperately to burn excreta under conditions which force him, in the words of an old but caustic dramatist,[2]

"to suffer wet damnation to run through 'em."

It is remarkable how opinions differ on the subject of the utility of incineration. Some appear to employ it successfully under all kinds of conditions, others have little use for it and magnify any nuisance which it may produce. There can be no doubt that a great deal depends on proper construction, adequate precautions, and an efficient technique. Given these desiderata, wonderfully good results may be obtained, even under trying circumstances. Like everything else in the practice of hygiene, incineration demands the exercise of common sense, attention to detail, and careful supervision.

The collection, removal, and disposal of refuse is a section which can be made far from uninteresting and can be lightened by a few historical references. Thus Zanzibar of the present can be compared with the "Stinkibar" of Livingstone's days, while the evolution of methods of disposal from the crude dump to the scientific process on which the Beccari system depends can be handled in a manner sufficiently attractive. Incineration will again come to the fore, but in some ways the incineration of refuse is a different problem to the incineration of fæces. Both may, of course, be combined, and in this connexion a few words on stoking and stokers will not be out of place.

Disposal of Waste Water.

The student should be warned that in many parts of the tropics one of the most difficult problems he will be called upon to consider, if not to solve, is the disposal of waste water. I believe that one would not be far wrong in saying that sullage has sullied not a few health records. What with difficulties due to heavy rains, to clayey soil, to soap, to offensive matters as in the case of sugar factories and slaughter-houses, to the fouling of natural watercourses, and to decomposition, the task of dealing with waste waters is often the bane of a medical officer of health in a country where there are no convenient drains and sewers to hide it from the sight and smell of the public.

Still, there are ways of getting over most of the difficulties, and amongst them the student should be taught the value of the use of lime. Disinfection and disinfestation call for careful exposition. The rôle of the tropical sun as a deodorising and disinfecting agent, its desiccating effects in desert regions, its limitations, and the known records of its action on pathogenic micro-organisms both in soil and water may precede a lecture of the more customary type introducing physical and chemical agents and their application.

Disinfestation.

If the myth of terminal disinfection has been exploded in the case of the communicable diseases of temperate climates, still more may it be relegated to obscurity in lands where intense sunlight and the sun's heat, fresh air, and the free perflation of wind are readily obtainable and where soap and water and limewash are nearly as cheap as in Europe. In the tropics disinfestation is more important than disinfection, and time may profitably be spent in a consideration of the manifold methods in use for destroying vermin, employing that term in a broad sense. Foremost amongst the vermin comes the

[1] The Practice of Medicine in the Tropics. Edited by Byam and Archibald.

[2] Cyril Tourneur.

house-fly, and this ubiquitous insect must be faithfully followed, along preventive and destructive lines, from egg to imago.

Formerly lice did not greatly concern the tropical hygienist, at least as disease vectors, except in certain parts of British India and in subtropical countries, for louse-borne typhus was rare and relapsing fever was largely confined to the regions mentioned. The recent southerly advance of louse-carried spirochætosis in the northern half of Africa has, however, put a different complexion on affairs, and in countries like Darfur and the French Sudan, Senegal, Northern Nigeria, and the hinterland of the Gold Coast, health officers have had to fight the loathly louse as it was fought during the Great War. The mention of spirochætosis serves as a reminder that we must class ticks amongst our vermin, notably, of course, *Ornithodorus moubata*, the intermediate host of *Spirochæta duttoni*.

General Health Measures.

Here or elsewhere the question of ridding ships of rats, fleas, cockroaches, and other pests must be ventilated. Perhaps it is best to relegate it to a section which may conveniently have the general title "Health Measures," and in which, after brief accounts of the methods employed in combating such typical maladies as ankylostomiasis, schistosomiasis, cholera, dysentery and enteric fever, filariasis and malaria, leishmaniasis and phlebotomus fever, plague, sleeping sickness, small-pox, undulant fever, yellow fever and rabies, the lecturer should pass to the hygienic control of shipping and of pilgrims, of camps and plantations, of railways and caravan routes. Quarantine will form part of his theme, and he will expound international law as it affects this great question. To lighten his subject and to aid the student both in his memorising and in his understanding of the facts put before him the teacher may have recourse to literary excursions like the following alliterative jingle on the causes of enteric fever. I have already published it, but not in its latest form. Here it is: Careless contacts and convalescents, carrier cases (chiefly cooks), defective drains, doubtful dairies, dirty drinking water, the dust of dried dejecta, faultily-gutted fried fish, sewage-soaked shell-fish, soiled salads, and the repulsive regurgitation, dangerous droppings, and filthy feet of fæcal-feeding flies fouling food.

In connexion with malaria it is important, if possible, to give a little instruction on the sanitary engineering sides, for both minor and major works of "bonification," as they term it in Italy, have an important bearing on malaria control, and the health officer should be in a position to discuss such matters in an intelligent manner with the engineer.

The *hygiene of native labour* in the tropics will doubtless have been largely dealt with under the headings housing, food, and conservancy, but the subject is not easily exhausted, and, to cite one matter only which should not be forgotten, there is the prevention of pneumonia by guarding against chill. How frequently do coolies exchange the atmosphere of a hot sugar mill or negroes that of the warm, humid depths of a deep mine for comparatively cold evening air and suffer in consequence. The provision of sweaters, if their use can be enforced, is often of great value, but only occasionally do we find this cheap and simple measure in vogue.

Even with every refinement of hygiene death will reap his victims and so *disposal of the dead* is a subject which will occupy a few minutes. Something should be said about special methods employed by races inhabiting the tropics and, in addition, the student should be told how best to embalm a corpse, for nowadays it is by no means uncommon, particularly in American circles, to require the return of the deceased tourist, traveller, or man of business, and the remains must be transported in a hygienic state, otherwise there may be trouble in several directions.

Public Health Administration.

The course may suitably conclude with some remarks on public health administration and organisation in the tropics, though, if it is preferred, this may constitute the opening subject. Personally, I am inclined to think it comes best at the end when, from the knowledge he has gained, or at least from the facts put before him, the student is better able to appreciate the situation and to realise that the duties of a health officer in the tropics differ in many respects from those he has to perform, say, in England, and that various modifications are necessary both in the administration and the organisation of a public health department.

It is, of course, impossible to deal with all parts of the tropics from this standpoint, but there are certain difficulties and certain essentials common to all and, on these the lecturer, if he is wise, will concentrate. Above all things he should impress upon his hearers the value of trained and efficient sanitary inspectors, those links between the medical officer of health and the populace, those employees, worth their weight in gold if they are good, who deal with details and, in the tropics, more perhaps than anywhere else, everything depends on attention to details. The number of European sanitary inspectors must perforce be limited, and so the training of a native inspectorate in the principles and practice of hygiene becomes a duty which the health officer has to shoulder and which will, as a rule, well repay the time he devotes to it.

It is scarcely possible to deal in any way adequately with sanitary law as applied to tropical practice, but I think students should be advised to study the regulations in force in various countries. Especially should they consider ordinances relating to mosquito control and the milk-supply, for they will find that the proper wording of such ordinances is most important and that their advice will be sought on these points.

LENGTH OF COURSE.

Well, we have reached an end, and it will be asked, "How long should such a course occupy?" I believe it might with advantage extend over three months, but, as a rule, that will be found impossible, at least if it is combined with the instruction in tropical medicine which we have already considered. Here we devote about 35 hours to these subjects and spread the course over a period of three weeks. I admit this is not sufficient, but it does give the class a certain grounding in the subject, and by reading and museum work the students can supplement this instruction, though they will never get a proper grasp of it until they have been "through the mill," as we say, and learned, perhaps by sad, and certainly by useful, experience, how to adjust themselves to new conditions and how best they may serve in that high calling of which they must be both the exponents and the disciples.

LABORATORY WORK.

I have said nothing about public health laboratory work, the chemical analysis of water, food, sewage, and so forth. It is true that, in the tropics, the health officer may have himself to carry out any tests which he thinks should be performed for, save at large centres, there are not, as a rule, any public analysts. On the other hand, in many places chemical laboratories exist where such work can be done by a trained chemist who, as a rule, can perform it more efficiently than the medical officer. In the absence of the necessary chemical equipment the medical officer is powerless, and hence, in a course such as I have described, it would be futile to attempt to include a laboratory training in public health chemistry.

Where, however, men definitely intend to devote themselves to health work in the tropics, they should be in a position to understand the significance of an analyst's report, and will best be able so to do if they themselves have some familiarity with the methods of the chemical laboratory. Hence, if they have not been through the D.P.H. course, I think provision should be made for their instruction in certain aspects of public health chemistry and also in bacteriology from the hygienic standpoint. Indeed, this is more important than the chemistry, for tropical conditions

may modify bacteriological standards, as, for example, the *B. coli* test in water work. This laboratory training would seem to attain a greater importance now that the Colonial Office has decreed that the possession of the D.T.M. & H. will qualify a man to hold a health appointment in places and districts other than those where large populations are congregated.

Men intending to take up such appointments, or to devote themselves to public health work, should also be given some instruction in vital statistics and statistical methods, and should learn more about epidemiology than they can in the tropical medicine course.

It is no doubt impossible to attain perfection in teaching tropical hygiene outside the tropics, and it is difficult to find sufficient time to devote to it, but a measure of satisfaction may be attained, by teachers and students alike, if we act on the advice enshrined in the old saying from the Book of Tobit: "If thou hast much give plenteously; if thou hast little, do thy diligence gladly to give of that little."

ON THE COMPLICATIONS OF FRACTURES OF THE LONG BONES.

By C. H. FAGGE, F.R.C.S. Eng.,
SURGEON TO GUY'S HOSPITAL.

THE disabilities which may follow a simple fracture of a long bone may be grouped under the following headings:—

1. Those affecting the bone itself, in the main purely mechanical; they result from failure to restore alignment or to maintain an alignment once restored. Whether they be classed as mal-union or as non-union does not affect the thesis of this paper, which argues that a vast majority of such results are preventable, and attempts to show why they occur and the principles on which their prevention should be based.

2. Those involving the muscles. Incorrect alignment of the fragments or involvement of tendon beds by callus alters the mechanics of their pull. These disabilities are exactly correlated with those of group 1, and are therefore equally preventable. Ossification of muscles is a very rare complication which may occur after fracture of the lower end of the humerus in childhood; but as, in my experience, it is directly attributable to rough handling and early passive movements, it is equally preventable, though by a different method.

3. Those affecting adjacent joints. Some of these are mechanical and, when due to simple causes such as the involvement of a joint surface by a misplaced fragment or by callus, are in most cases preventable, either by careful reposition by open operation of the intra-articular fragment so that exuberant callus which will hamper normal movement is not thrown out, or by removal of such a fragment when, owing to its size, position, or comminution, replacement is not practicable. By far the most common, depreciating, and incurable of the joint complications is that commonly termed chronic traumatic osteo-arthritis, which most of us have been accustomed to regard as an inevitable sequel of some fractures, particularly those is the vicinity of joints, in the middle-aged or aged. Yet we know that similar arthritic changes occur universally before the age of 21 in the hip-joints of those patients who in infancy have been subjected to manipulative reposition for congenital dislocation. Realising that this can best be explained on a mechanical hypothesis, we may venture the opinion that traumatic arthritis will occur only when the mechanics of the part are altered by a fracture, which is usually in close proximity to the joint, and that the mechanics are altered because alignment is imperfect. If this be accepted, we are forced to the conclusion that the arthritis is at least in part due to faulty alignment and is therefore preventable. This argument must not be pressed too closely, for it is conceivable that interference with the nutrition of the joint surfaces, owing to the injury, may be a factor of importance: that such a trophic influence does exist is shown in the marked atrophy with absorption of lime salts which occurs uniformly in the smaller fragment of these fractures.

4. Those due to nerve involvement; these are relatively rare and in common practice only comprise dropped wrist, due to musculo-spiral injury with fracture of the humeral shaft, and ulnar paralysis with fracture of the inner humeral epicondyle. I do not propose to discuss these fully, but must most forcibly insist that such paralyses are not, as most text-books state, due to involvement of the nerve by callus, but are due to its actual injury at the time of the accident by the force which caused the fracture, and that their pathology is an interstitial bruising which in most cases will recover, and will certainly do so provided the nerve is put under conditions which favour its natural capacity for repair. As it is at present impossible for any neurologist to suggest, even in the vaguest terms, the anatomical degree of nerve injury which exists in such cases, the surgeon must protect himself by the only means at his disposal and ascertain by direct inspection what damage has been done to the nerve in every case in which there is the least doubt—which means in almost every case.

First Principles.

Any attempt to discuss in more detail the prevention of the disabilities which are due to the fracture itself drives us to discuss first principles. The causes of displacement are the force which produces the fracture, gravity, and muscular pull. For some years the writer, in common with most other surgeons who have allowed themselves to think on such matters, has been teaching that the chief cause of displacement is the force which produces the fracture, and that the pull of muscles which may chance to be on one or other side of the fracture is not, as stated in most text-books, a very important factor in displacement; although after the fracture has occurred the natural tone of all muscles round the bone undoubtedly causes overlapping, and an unbalanced muscle or group of muscles may affect displacement. This is a fundamental assertion which governs most of what follows. Whenever one can exactly ascertain the direction of the force which caused a fracture, one finds that the displacement exactly conforms to this and, as the direction of the force may vary, so the displacement in any given fracture is not uniform.

Again, in our earliest surgical infancy we learn that transverse fractures are due to direct violence. They usually are, yet in many cases of transverse fracture the patients assure us that the blow was not direct, and this is confirmed by the absence of local injury to soft parts. A force great enough to break a bone directly must cause very grave damage to soft parts; yet in many fractures which are almost transverse no local bruising exists and we are forced to the conclusion that such fractures are examples of very short spirals and are caused by torsion. This view is supported and its scope enlarged by G. F. Stebbing's [1] hypothesis that fractures through the base of the neck of the femur are not caused by direct violence, but by torsion. Every surgeon sees several transverse fractures a year in which it is impossible to imagine how a force could be applied directly to the bone at that spot so as to cause the fracture. Whether direct or indirect, however, the force which causes a fracture cannot be supposed to cease immediately the fracture has occurred; its continuance causes displacement, and the greater it is or the longer it acts the more wide will be the separation of the fragments. The gap between the displaced bone ends must be occupied by soft parts, which are second only to sepsis as a local cause for non-union. The presence of soft tissues between fragments has long been recognised by two signs—viz., the absence of bony crepitus and the failure to restore alignment by manipulation

under an anæsthetic. To these I wish to add a third—an appreciable gap between the fragments as seen on an X ray plate. In my experience a gap of ¼ inch or more means the intervention of soft parts and forebodes non-union. It seems probable that the influence of intervening muscle is relative. A thin layer must intervene in almost every fracture; why, therefore, non-union does not occur more often, or how the offending tissues are got rid of, we do not know, but we must admit that the intervention of soft parts of a certain thickness is a sure barrier to the laying down of internal callus by osteoblasts from the bone-marrow.

I well remember in 1912 being astonished that the Fracture Committee of the British Medical Association so readily accepted the conclusion of their small drafting subcommittee, of which I was a member, that "a good functional result depends exactly upon a good anatomical result"; I have been still more surprised that the profession in this country and in the United States have never questioned this principle. These sensations, however, are mild compared with my horror at the almost daily examples of complete failure to carry it into practice. The more I see of fractures the more I am convinced of its truth and, after 15 years' test of its value, I am forced to admit that nearly all the bad results which I deplore in my own practice are due to a lapse from its logical employment.

Most of what is written above particularly applies to fractures of the lower third of the tibia, for, as has long been known, the mechanical defects of deformities resulting from fractures of the leg are indifferently compensated. Ashhurst [2] offers as an explanation of this that it is the only segment of a limb where the joints which bound it above and below carry out similar movement on identical axes.*

Reduction on the X Ray Table.

Even in hospitals to which large medical schools are attached the value of inspection and reduction of fractures under an anæsthetic on the X ray table is entirely unappreciated. Its chief value to the surgeon lies in an ocular demonstration of the maximum displacement, which is at once ascertained by rotation of the limb first in one and then in the other direction; this may disclose a far greater deformity than is shown by the plates or films usually taken as a routine in the antero-posterior and lateral planes. Scarcely less important is the advantage to the patient gained by observing under the screen that precise position, checked in two planes at right angles to one another, in which deformity is reduced to the minimum; it may at the time be impossible or unwise to fix the limb in the optimum position, but if this is known it can be readily achieved at the selected time. No one can study on the screen the optimum position for reduction in any series of fractures for six months without discovering the fact that in no two consecutive examples of what are apparently similar fractures is correct alignment secured in exactly the same position. In other words, each individual displacement has an individual position in which reduction of deformity is secured. This is only what commonsense would suggest, yet text-books describe stereotyped positions for every fracture, and witnesses in legal actions give evidence that a definite position is necessary for satisfactory treatment. How can witnesses who have not seen the fracture on the screen before treatment express an opinion on the optimum position—i.e., the particular pose that will secure correct alignment for this particular displacement?

Early Operation.

If we fail under ideal conditions to reduce the deformity on the X ray table, a second attempt is made; if this fails, we must realise immediately that some kind of operative reduction is necessary, and it is at this point that so many who treat fractures fail to carry into effect the principle which they know to be true, and rely apparently on the occurrence of some miracle by which the bad anatomical result which they know to be present shall be converted into a good functional one. A recent ununited fracture is as a rule easy to reduce during the first three weeks by open operation; and within certain limits a perfect anatomical reduction can be guaranteed if operation is done within this period; an operation for the correction of an old malunited fracture is often one of the supreme trials of manipulative skill, physical endurance, patience, ingenuity, and self-control. The most obvious advantage of early operation is that before new bone has had time to form and round off the rough broken ends, each little irregularity can be exactly fitted into its original place, and no time is taken up in breaking down a partial union. The bone ends become smoothed down after about three weeks, but I have recently found the line of fracture absolutely unchanged in a young man after 11 weeks; this is most unusual, especially in the young. Another advantage of early operation is the prevention of bone atrophy, which always occurs in the compact tissue of the smaller fragment, and is especially marked in the aged or alcoholic. It is of secondary importance, but any surgeon who finds himself faced with an operation on such a bone will take care to eliminate the risk in another case, for it is shown on X ray plates.

The indication for operative treatment is the failure to obtain or maintain reduction of displacement by manipulation. The phrase "reduction of displacement" can be otherwise expressed as restoration of alignment; it means that the fragments must occupy their normal positions and relationship to one another. How far this is necessary to sound union and functional efficiency is unfortunately a matter of opinion. "Unfortunately" is written advisedly, for, while it is agreed that end-to-end apposition of at least 25 per cent. of the fractured surface is desirable for firm union and that errors of alignment and angulation are readily overcome as growth proceeds in the young, yet beyond this there is a wide margin between what is deemed satisfactory by one and what is regarded as essential by another. All my experience tends to demand a more perfect anatomical result, for often the X ray plate has not been taken in the plane of maximum deformity, and displacements tend to get worse rather than better, particularly in the old and particularly in the leg.

Varieties of Operative Treatment; their Indications and Limitations.

1. The simplest form of operative treatment is reduction by leverage through an open incision without the introduction of any internal splint. This is particularly applicable to the common supracondylar fracture of the lower end of the humerus in children, fractures of the radius at the adolescent level, and separation of the lower femoral and upper humeral epiphyses. Many writers talk of operations on fractures as if internal splinting were always essential; of all forms of operation simple reduction is the most universally applicable, and it is far too rarely employed. Its use must be limited to transverse fractures, particularly where only one of two parallel bones is fractured, the other acting as a splint; or to fractures so near joint surfaces that an internal splint is impracticable. An open wound is no bar to this method, and in fact extends its range of usefulness, for, as infection may be unavoidable when reposition has been secured by open reduction, it is safer to rely on external splinting for the maintenance of position than to introduce unabsorbable internal splints.

2. The removal of detached fragments is a confession of failure, which is obvious when a fracture of the humerus complicating a dislocation of the shoulder-joint necessitates excision of the head. It must be admitted, however, that this is occasionally the only

* The leg is the only segment of a limb where the joints at both extremities of the bone are hinge joints.

practical procedure, and that the results are sometimes better than those secured by more conservative measures. Failure is less obvious when a small articular fragment is seriously comminuted, as is seen in stub fractures of the head of the radius, when excision is the only means available until such time as a suitable glue can be used.

3. Absorbable internal splints in the form of bone-grafts, whether homogeneous or heterogeneous, have, in my opinion, a very small field of usefulness and one practically limited to bridging a gap where a bone deficiency exists. I hold it as a fundamental principle in their use that they should not be subjected to stress or strain and that they must be secured; if this be true, they provide no alternative to internal unabsorbable splints, which are usually a necessary reinforcement.

4. I see no reason why some surgeons prefer an unabsorbable ivory peg to wire, screws, plates, and other metal appliances, except a lack of confidence in their surgical cleanliness. If exact restoration of shape and complete immobilisation is desired, there is no method which secures it in anything like so certain a measure in most long bone fractures as the use of plates and screws. I find no tendency for screws to loosen save in the presence of sepsis, which is almost always introduced by the operator. Though some of my cases were operated on more than 20 years ago, I see no reason for a routine removal of plates except in open fractures. Comminution, multiple fractures, and the proximity of less than two inches of a joint are an absolute bar to the employment of intramedullary pegs; the same applies, though to a less degree, to plates, though, when the main fragments are fixed together with a long plate, smaller fragments can usually be pushed into place, where they will remain.

Sometimes the problem is lack of union—e.g., a fracture has been immobilised for some six weeks and there is no sign on manipulation of solidification of the fracture. My practice is to treat the limb for another six weeks by complete immobilisation in plaster; whenever possible the patient walks on crutches, and a Bier's bandage round the thigh may help. If after this period there is no union, operation is indicated. I think these cases should be classified as cases of delayed union, and I have a suspicion that the usual cause of this delay is a thin layer of soft tissue between the bone-ends which the osteoblasts of the medulla have difficulty in permeating.

Conclusion.

The thesis of these remarks is that most, if not all, of the disabilities resulting from fractures of long bones are due to mal-union, the result of incomplete correction of displacement; that these are in the main preventable, and that the correct treatment of mal-union is prophylaxis. It must, however, be admitted that the period in which complete correction of deformity is possible must occasionally be allowed to elapse without any endeavour having been made to correct, owing to the very serious condition of the patient; but, unfortunately, this is not the excuse for the majority of bad results which surgeons are called upon to correct.

References.—1. Stebbing, G. F.: British Journal of Surgery, 1927, xv., 201. 2. Ashhurst, A. P. C.: Surgery, Gynecology, and Obstetrics, 1922, xxxv., 662.

THE SERUM TREATMENT OF SCARLET FEVER.

BY J. A. SCOTT, M.D. LIVERP., M.R.C.S. ENG., D.P.H.,

LATE RESIDENT MEDICAL OFFICER, CITY HOSPITAL NORTH, LIVERPOOL; ASSISTANT MEDICAL OFFICER, SURREY COUNTY COUNCIL.

THE benefits of scarlatinal streptococcal antitoxic serum in the treatment of scarlet fever are generally recognised, and an attempt is here made to compare the course and complications of the disease in cases so treated, with its progress in cases receiving identical treatment with the exception of the serum. Case records of 150 serum-treated patients at the City Hospital North, Liverpool, over a period of 15 months from 1925–27, have been collected and the results analysed. The serum was not used as a routine measure, but only for the more pronounced cases. As most observers note that the response to antitoxin after the fourth day of the disease is but slight the series have been divided into two groups—119 cases receiving antitoxin before the fourth day, and 31 cases receiving it for the first time after the fourth day.

Dosage.—Concentrated scarlatinal streptococcal antitoxic serum was used in each case, 10 c.cm. being injected intramuscularly in the vastus externus muscle. 137 of the cases received the serum prepared by the Lister Institute, 10 that of Messrs. Parke, Davis and Co., and 3 that of Messrs. Burroughs Wellcome

TABLE I.—*Comparison of Serum-treated Cases in 1926 with Cases in 1925 and 1926 Receiving Ordinary Treatment.*

—	Serum-treated cases.		All cases 150.	Control cases.	
	Serum on or before fourth day: 119 cases.	After fourth day: 31.		1925. 120 cases.	1926. 120 cases.
Before serum: controls on third day. Average temperature	101·9° F.	101·5° F.	101·8° F.	99·8° F.	99·6° F.
" pulse-rate	136 per min.	133 per min.	135 per min.	119 per min.	118 per min.
" respiration	26 "	25 "	26 "	23 "	23 "
24 hr. after serum controls from third to fourth day. fall in temperature	2·3° F.	1·7° F.	2·1° F.	0·7° F.	0·85° F.
" fall in pulse-rate	17 per min.	10 per min.	15 per min.	8 per min.	9 per min.
" fall in respiration	2 per min.	1 per min.	2 per min.	1 per min.	1 per min.
Average day temperature becomes normal	6th	12th	7th	7th	6th
Per cent. of cases with *no* complications	70	45	65	55	65
Per cent. of cases *with* complications—					
Adenitis	14	41	20	16	18
Otitis media	10	17	11	12·5	7·5
Rhinorrhœa	5	17	8	17	7
Arthritis	9	7	8	5	3
Nephritis	2	7	3	6	3
Bronchitis	1	3	1	2	2
Relapses	—	—	—	1	6
Case mortality (per cent.)	—	—	1·3	2·5	—
Serum rashes (per cent.)	—	—	10	—	—

Dose of serum: 10 c.cm of concentrated serum intramuscularly. 11 per cent. of all cases received two or more injections.

and Co. 11 per cent. of the cases received two or more injections, the maximum number given being six injections.

Control.

The selection of an adequate control series was rather difficult, as all the more serious cases from November, 1925, were treated by antitoxin. Owing to seasonal variation in the incidence and virulence of the disease it was thought best to adopt two series of controls, each over a full year, one from the 1925 cases before the serum was used and one from the mild, non-serum treated cases of 1926. Accordingly the first ten cases admitted to the hospital in each month in 1925 and in 1926 were grouped and analysed, the results being shown parallel with those of the serum-treated group in Table I. As in the latter group the average day of serum administration in those cases treated before the fourth day was the third, the average temperature, pulse, and respiration rate on this and on the fourth have been noted in the control groups and the fall in each in the 24 hours tabulated for comparison with that in the serum-treated groups.

TABLE II.—*Classification of Nature of Disease.*

—	Septic.	Severe.	Mod. severe.	Moderate.	Mild.
	Per cent.				
150 serum-treated cases ..	8	22	39	18	13
120 control cases—1925 ..	3	6	—	28	63
120 control cases—1926 ..	—	—	—	18	82

TABLE III.—*Age-distribution of Cases.*

—	0–5 yrs.	5–15 yrs.	Over 15 yrs.
	Per cent.		
150 serum-treated cases ..	32	57	11
120 control cases—1925 ..	30	59	11
120 control cases—1926 ..	30	66	4

The classification of the nature of the disease and the age-distribution of cases are shown in Tables II. and III. respectively. The age-distribution is approximately the same in all groups. The type of disease in the 1925 control-group, during 11 months of which no serum was used, was more severe than that in the 1926 controls. Table I. shows that the fall in temperature, pulse-rate, and respiration-rate in the serum-treated cases is about twice that in the controls from the third to the fourth day, while the complications in the former group, except for suppurative otitis media and arthritis, are much the same as in the mild 1926 group and less than in the 1925 group. It is of interest to note that five cases of arthritis in the serum-treated group arose about the tenth day; though unassociated with a rash, they may be a manifestation of the serum administration rather than a complication of the disease.

Together with the fall in temperature and pulse-rate after the administration of serum, the patients exhibited marked subjective improvement and the pain and discomfort of anginoid conditions of the throat were greatly relieved. In 12 of the treated cases a profuse rhinorrhœa ceased very dramatically within 48 hours. The benefits of serum, in the dose employed in the present series, are less marked if given after the fourth day, but a temporary alleviation of symptoms was often noticed.

The good effects of the treatment are to some extent reflected in the mortality figures of scarlet fever admissions to hospital, which were 1·88 per cent. in 1925 and 0·75 per cent. in 1926.

Conclusions.

1. Scarlatinal streptococcal antitoxic serum, given early in the disease, causes a fall in the temperature, pulse, and respiration rates, relieves the subjective symptoms, and prevents the development of complications. 2. In the doses employed in this series no immediate benefits were noted in cases treated after the fourth day of the disease.

I am greatly indebted to Dr. R. I. Richardson, visiting physician, City Hospital North, for permission to make use of the hospital material and records, and also for much clinical advice and help.

MINOR TUBERCULOSIS.*

BY E. WARD, M.D. CAMB., F.R.C.S. ENG.,
TUBERCULOSIS OFFICER, SOUTH DEVON.

Two decades of collective effort to eliminate tuberculosis justifies an attempt to review our conception of the disease.

The Victorian conception of tuberculosis may be summarised as: "A fatal disease; when recovery ensues the diagnosis should be revised." Then came what might be called the Edwardian conception: "A widespread disease as a pathological finding, but always dangerous, and often fatal, when causing symptoms." I would like to formulate a Georgian conception: "A widespread disease terminating usually in uneventful recovery among the highly resistant majority of the population, but dangerous to a minority with low resistance."

Minor tuberculosis, that is, tuberculosis as manifested in the highly resistant majority, occurs at one time or another in the lives of 40 per cent. of human beings. In busy private practice I often noted patients with one or two symptoms suggesting tuberculosis: a cough, wasting, lassitude, "run down," weakness, chest pains, or sometimes hæmoptysis. Under observation the symptoms almost always passed off, but rarely an individual patient developed typical phthisis pulmonalis. As tuberculosis officer, following in their homes the lives of some thousands of contacts, I am convinced that this minor tuberculosis is very real, and that recognition of its existence will clarify our ideas on tuberculosis, smooth out some differences of opinion among able observers, and perhaps provide a key to the whole problem.

A few instances may be given:—

CASE 1.—During the spring of 1916 a medical man of 38 was rejected for war service because an examining board detected pulmonary tuberculosis. The patient was tall and thin with sloping shoulders, the type described as "homo popleus." He had worked hard during the winter, and had suffered the last few months from a troublesome cough. His weight was 3–4 lb. below normal, and he had lately found work more tiring than before. There was a slight atrophy of the right upper trapezius with perceptible drooping of the shoulder. Dullness, diminished expansion, and a few crepitations were noticed at the right apex, or a few crepitations were also heard on the left side. The patient did not cease work, but took a few commonsense precautions, and has continued with no recognisable symptoms since the summer of 1916.

CASE 2.—A medical man of 51 was seen in the summer of 1918. He had felt ill and run down lately, and his habitual morning cough had become worse; there had also been fugitive chest pains. Ten days previously there had been a morning hæmoptysis of 3 oz. The patient was pale, thin, and rather haggard-looking; a few physical signs were present at the left apex, and dullness, with some pleuritic crepitations, at the right base. I pressed him to take a holiday; he refused, but became much more careful than in the past. At 59 he continues frail, but there have been no further symptoms of importance, and he is still in active practice.

CASE 3.—A doctor's daughter and lady dispenser, aged 23, came for advice because she had expectorated a mouthful of blood; there was also a dry cough, occasionally troublesome. The patient's father had died from tuberculosis, and

* From a paper read before the Plymouth Medical Society.

a few years previously she had nursed and slept in the same room with a cousin who subsequently died of phthisis. The patient was active, frail, and thin, with a slight stoop; there was dullness at the apex of the right lower lobe. It was difficult to decide what advice to give: she was allowed to continue work under observation and an improved régime. Four years later she married, and remains well after 12 years of married life, during which she has borne three children.

CASE 4.—A school teacher, aged 26, had signs and symptoms suggestive of tuberculosis, and the sputum, on the one occasion that it was obtainable, contained tubercle bacilli. A short holiday and a few adjustments were the only treatment. Fourteen years later she continued to work regularly without symptoms.

Among children tuberculous manifestations are also common—e.g., failure to thrive, prolonged pyrexia, gastric troubles, and sometimes cough. The following history, sometimes heard in chronic adult pulmonary tuberculosis, illustrates the difficulties which occasionally arise: (*a*) as a child prolonged pyrexia labelled typhoid, rheumatic fever, or influenza; (*b*) from 15 to 20, tonsils removed for bad health, perhaps more than once; (*c*) about 22, an attack of pleurisy; (*d*) at 24, appendicectomy; (*e*) at 28, all teeth removed, and perhaps a course of vaccine therapy; (*f*) at 32, phthisis diagnosed.

Minor Tuberculosis and the Work of the General Practitioner.

The suggestion that the great majority of tuberculous lesions discovered at autopsy have given rise to symptoms during life is borne out by experience in other diseases. A large percentage of autopsies reveal gall-stones; it was once thought that most of these had been symptomless, but now that we are beginning to recognise the symptoms they may cause, it seems probable that very few cases, if any, are really symptomless. They constitute a proportion of those dyspepsias which it is the lot of general practitioners to treat. The duodenal ulcer which perforates without previous symptoms is also becoming a great rarity now that the symptomatology is better known.

There is a tendency for symptoms to go unrecorded, and sometimes unnoticed, when their cause is unrecognised. The study and coördination of such symptoms is essentially the scientific province of the general practitioner.

The existence of minor tuberculosis is increasingly recognised. Some speak of latent tuberculosis, but this does not seem the best word when symptoms are present. Others call the condition a tuberculous infection, as opposed to tuberculous disease, but the difference between the two is of degree only. To me "minor tuberculosis" seems a better phrase.

Once the condition is fully recognised it must modify our work and teaching in many directions. Statistics are incomparable when one observer includes minor cases and the other only the graver ones. In conjugal tuberculosis, for instance, if minor disease is included, an infection will be found in the majority of cases, but if our attention is limited to major cases, occurring in the 2 per cent. of the population who have low resistance, conjugal infection becomes rare. Similar remarks would apply to any estimate of infectivity in tuberculosis, and to sanatorium statistics. If the patients sent to sanatoria are always to be "early" cases a number of minor cases will be included, and these could quite well be treated at home.

For practical purposes sputum-positive cases are all major, so that statistics based on sputum tests are comparable; but these constitute only a portion of the tuberculosis literature.

Allergy and Pneumococcal Infections.

Besides minor disease, two other factors modify our conception of tuberculosis: allergy and other pulmonary infections.

Koch's phenomenon is well known. A guinea-pig infected for the first time with tubercle bacilli may die of the disease, but show no local signs at the site of inoculation. If, however, after a sublethal dose of bacilli, a second injection is given, there is a violent local reaction which often results in sloughing. The animal is said to be in a state of allergy. Tulloch and Munro have shown that by thus sensitising a guinea-pig we may simulate the fibro-caseous phthisis of human beings. It seems likely that the easily recognised, typical phthisis of man is the result of some such sensitisation, the pathological and clinical pictures depending largely on the degree of allergy. Therapeutically just the right amount of allergy should be our aim, so that there will be a reaction at the site of infection, but no breaking down.

Inseparably connected with the tuberculosis problem are other forms of pulmonitis, especially pneumococcal infections. Tuberculosis disposes to catarrhal infections and these dispose to tuberculosis. This, indeed, is the greatest difficulty in diagnosis. We read strongly worded opinions that patients with bronchitis must not be called tuberculous, and opposing views are also held. A way out might be found by speaking of "catarrhal pulmonitis" and "tuberculo-catarrhal pulmonitis." In the diagnosis of pulmonary tuberculosis the chief erroneous tendencies are, on the one hand, in patients only slightly ill to diagnose minor tuberculosis as something else, and, at the other end of the scale, in patients obviously ill, to diagnose chronic pneumococcal infections as tuberculous.

A LOCALISED OUTBREAK OF BACILLARY DYSENTERY IN SMETHWICK.

BY A. G. MILLOTT SEVERN, M.A. CAMB., M.D. BRUX., D.P.H.,
DEPUTY MEDICAL OFFICER OF HEALTH, COUNTY BOROUGH OF SMETHWICK;
AND
EWART W. EVANS, M.R.C.S. ENG.

DYSENTERY has not been a common disease in England since public health principles have been widely applied, but in the seventeenth and eighteenth centuries the "bloody flux" was one of the formidable diseases of this country, as is shown, for example, by the Bills of Mortality of that period for the City of London. After the war it was thought that demobilised soldiers from abroad would reintroduce infection, and dysentery was made compulsorily notifiable under the Public Health (Pneumonia, Malaria, Dysentery, &c.) Regulations, 1919, in order that the authorities might have adequate control over these diseases, and give prompt assistance in combating possible epidemics. This policy has proved a wise one, and several epidemics, small and large, have been investigated and checked. The number of notified cases of dysentery and deaths registered since the adoption of compulsory notification in England and Wales is as follows:—

Year.	Cases notified.	Deaths registered.			
		Total.	Bacillary.	Amœbic.	Other or unspecified.
1919	1638	435	?	?	?
1920	1169	254	?	?	?
1921	1193	261	17	11	233
1922	757	216	21	10	185
1923	458	149	12	13	124
1924	356	130	13	8	109
1925	293	135	13	11	111
1926	486	142	11	14	117

It will be seen that the numbers have diminished considerably during the last four years. The type has, in the great majority of cases, been bacillary, although the above table does not sufficiently indicate this. Amœbic dysentery has apparently never prevailed much in England; the climate or other conditions, for some obscure reason, are unfavourable to the propagation of this type, although healthy "carriers" of *Entamœba histolytica* are not by any means uncommon. Since the war several outbreaks of dysentery in England and Wales have been

investigated by medical officers of the Ministry of Health, and very complete records of their findings have been published in official reports.

Bacillary dysentery, before the war, was largely confined in this country to circumscribed outbreaks in lunatic asylums and similar institutions.

The interest of the outbreak here described lies in the completeness with which it was possible to trace the ætiology and correlate the various findings, and in certain individual features. No instance of dysentery had been reported in Smethwick since 1924, when one isolated case was notified, and since 1919 only 20 cases are known to have occurred locally amongst a population of over 75,000.

The outbreak which occurred at the end of July and the beginning of August, 1927, was limited to the families residing on the first and second floors of a tenement house in Smethwick. The symptoms, including pyrexia and the frequent passage of stools containing blood and mucus, were typical of acute bacillary dysentery. There were ten cases, the first being a child, attacked on July 22nd. The others followed rapidly, and all had similar symptoms, although they varied in degree; at least four of the patients were severely ill. There was no evidence suggesting case-to-case infection, and there were no deaths.

When the cases were reported to the local public health department every probable source of infection was investigated. The only common factor was the water-supply. The water consumed by all the sufferers on these premises had been taken from the bathroom tap connected with the hot-water system, and the water had not been heated for many months. This water, derived originally from the main town supply, was fed into an uncovered iron tank through a ball-tap valve and was passed through a cast-iron boiler and a closed iron cistern before reaching the tap from which it was drawn. The connecting pipes were made of galvanised iron. This supply had been used for some months because the main water tap was out of order. It was evident that the open tank had become specifically contaminated. The families residing on the ground floor used water from a separate tap connected directly with the main, and all escaped dysentery. The infection was confined to the women and children in the house; presumably the men took their liquid refreshment at work or outside their homes. One of the men volunteered the statement that he had never drunk the water from this tap as he always thought it had an unpleasant taste; he escaped infection.

Other lines of investigation and possible sources of infection were not overlooked, but there was no evidence that they had any connexion with the outbreak.

After a sample of the contents had been taken, the use of the water from the open tank system was prohibited; the tank and cistern were flooded with disinfectant, and no further case of dysentery occurred.

The bacteriological investigations were undertaken by Prof. C. J. Lewis, director of the public health laboratory of Birmingham University. Specimens of fæces from five of the patients were cultured, and a dysentery bacillus of the Flexner type was isolated from each. Blood specimens from the earlier cases were examined for the Widal reaction, and reported negative for *Bacillus typhosus* and *paratyphosus*. The blood serum of one of the patients was tested against the organism previously isolated from her own fæces, and agglutinated in a dilution of 1 in 40.

The residuum of water and deposit from the open tank was examined and intestinal bacilli of the coliform type and spores of *Bacillus enteritidis sporogenes* were found, thus demonstrating previous fæcal contamination. Actual dysentery bacilli were not isolated.

Our search was now directed towards the primary "carrier," and inquiry showed that a member of one of the affected families was an ex-soldier who had served in the Near East during the war and who had been in hospital suffering from dysentery and malaria in Salonica in 1918. Although he was still liable to attacks of malaria, he had not, as far as he was aware, had any recurrence of diarrhœal disease since his discharge from the army and return to England, nor did he contract dysentery during this epidemic. His blood serum was tested for agglutination against several organisms, and proved negative for the typhoid group, but positive in significant dilutions for one of the types of bacillus which had been previously isolated from the fæces of the patients. The agglutinins produced by his antityphoid inoculations during the war had thus disappeared. His cultivated fæces were at first negative for cysts or pathogenic organisms, but from a second fæcal specimen obtained a few days later, and plated on MacConkey's agar medium, a colony of non-lactose fermenters was isolated, and gave the cultural reactions of the *Bacillus dysenteriæ* of the Flexner type. This may be regarded as a satisfactory result considering the well-known intermittency of excretion of bacilli among dysentery "carriers."

Thus the chain of infection appears to have been traced completely, and little doubt is left that the disease was spread through the agency of the tank water, which had in turn been specifically infected from the dysentery "carrier" living in the house. It was obviously not possible to determine the exact manner in which the tank water became contaminated from the "carrier," but the only available water-closet inside the house, used by all the families concerned, was in a dirty and neglected condition. Rats had been seen, and flies and mice were prevalent on the premises, and would suffice to provide adequate transport for the infective fæcal material between the water-closet and the unprotected open tank.

Our reason for publishing a short summary of this outbreak of bacillary dysentery is to call attention to the danger of using for drinking purposes water derived from the usual type of hot-water system so frequently installed in private houses and commonly regarded as innocuous.

One other noteworthy point is the length of time, in this case nearly ten years, during which a "carrier" of dysentery may remain a potential source of infection to others in his immediate surroundings.

THE EFFECT OF INTRAVENOUS AND INTRAMUSCULAR INOCULATIONS OF NOVASUROL IN RABBITS.

By P. LAZARUS-BARLOW, M.D. Camb.,
ASSISTANT BACTERIOLOGIST, METROPOLITAN ASYLUMS BOARD, QUEEN MARY'S HOSPITAL FOR CHILDREN.

Novasurol is an organic mercury compound and consists of a double combination of the sodium salt of oxymercurio-o-chlorphenoxylacetic acid with diethyl-malonyl-urea. It is claimed to be a powerful diuretic, absolutely free from irritant properties, and therefore equally suitable for intravenous and intramuscular injection, especially in cases of morbus cordis associated with dropsy.

At the request of one of my colleagues four rabbits were inoculated intravenously and intramuscularly with various doses of the drug; the histological findings seem worthy of report. The inoculations were made as follows:—

A.—0·02 c.cm. novasurol intravenously on alternate days for three doses and the animal killed three days after the last inoculation.

B.—0·02 c.cm. novasurol intramuscularly into the thigh on alternate days for three doses and the animal killed three days after the last inoculation.

C.—0·02 c.cm. novasurol intravenously—

0·03 c.cm.	"	"	three days later.
0·05 c.cm.	"	"	two days later.
0·1 c.cm.	"	"	two days later.
0·3 c.cm.	"	"	three days later.
0·7 c.cm.	"	"	two days later.

D.—Received the same quantities as C, with the same intervals between doses, the inoculations being made into the muscles of the thigh. Rabbits C and D were killed two days after the last inoculation.

The doses given to A and B were considered to be approximately equal, weight for weight, to the dose for a child. The larger doses in the case of C and D were given to ascertain if any lesions that might be produced in A and B could be intensified.

Histological examinations were made from the liver and kidney in all four cases, and from the muscles at the sites of inoculation in the case of B and D, and showed the following:—

A.—Liver: A considerable degree of cloudy swelling throughout, the outlines of the cells for the most part being quite obliterated; this change is more marked in the centres of the lobules. The nuclei stain poorly. Blood-vessels and capillary spaces congested throughout. Kidney: Considerable cloudy swelling throughout both the convoluted and straight tubules; in many cases the cells are completely separated from the basement membrane. The organ is congested throughout.

B.—Liver: Some cloudy swelling; great distension of the capillary spaces, many of which are filled with blood. Vessels congested. Kidney: Cloudy swelling throughout; in many places the lumen of the tubules is completely filled with finely granular cytoplasmic debris. In places there is great separation of the tubules. The organ is congested and many glomeruli appear somewhat disintegrated. Muscle: Along the track of the needle there is considerable congestion and a well-marked fibroblastic reaction with numerous giant cells; muscle-fibres are almost entirely absent. On either side of the needle track the muscle is degenerated, the nuclei having disappeared and the fibres being hyaline in appearance.

C.—Liver: Cloudy swelling with slight fatty degeneration in places; vessels and capillary spaces congested throughout. Kidney: Glomeruli congested, and the majority show some vacuolation. Large numbers of convoluted tubules show either absolute necrosis or very marked cloudy swelling; a few appear fairly healthy. Many are filled with a hyaline substance. The straight tubules appear relatively healthy, some show cloudy swelling and degeneration, some contain a hyaline substance.

D.—Liver: Marked degeneration. Throughout the section the cell walls of the liver cells form an open network, in the meshes of which lie very poorly staining nuclei and some granular cytoplasmic debris. Kidney: Some glomerular congestion. Marked cloudy swelling of the convoluted tubules, but no areas of necrosis. The straight tubules show great destruction of cytoplasm, in many cases the nuclei lying free on the basement membrane. Capillaries rather congested. Muscle: There is an extensive area of completely necrosed muscle, the nuclei having disappeared. Large streaks of hæmorrhage are present, apparently along the tracks of the needle. At the periphery of the necrotic area is a well-marked inflammatory reaction, and in places considerable fibroblastic infiltration.

These sections show that novasurol may have a very profound action on the healthy liver and kidneys of rabbits; since in chronic heart disease the liver and kidneys are affected to a greater or less degree this fact may be of importance. In chronic heart disease the central portions of the lobules of the liver are most severely affected by the back pressure, and the experiments show that this is the portion of the liver on which the drug exerts its greatest effect. It would seem advisable, therefore, that in cases of long-standing heart disease where there is a possibility of damage to the liver through back pressure, the dose of novasurol should be much reduced. In such cases the kidneys also may become damaged, and the experiments suggest that if there be any nephritis or albuminuria the drug is contra-indicated, or at least should be given only in very small doses. The drug appears to have considerable irritant properties; no ill-effects, however, were observed at the sites of inoculation of the intravenous doses. It thus appears, as far as can be judged from animal experiments, that the intravenous route is superior to the intramuscular.

Summary.

Animal experiments suggest that in cases of long-standing heart disease the dose of novasurol should be considerably reduced, and that intravenous inoculation is more advisable than intramuscular.

Clinical and Laboratory Notes.

A CASE OF SPASMODIC AURICULAR FIBRILLATION AND BRONCHO-PNEUMONIA COMPLICATING SEPSIS IN THE PUERPERIUM

BY JAMES A. KERR, B.Sc., M.B. GLASG., D.P.H.,
SECOND ASSISTANT MEDICAL OFFICER, MONSALL HOSPITAL, MANCHESTER.

THIS case is considered worthy of record for several reasons. It is one with which any general practitioner might suddenly be confronted, and with which he might have to deal without a specialist opinion, and the primary treatment was carried out at a hospital not equipped with special cardiological apparatus, the writer having no special experience in the newer cardiology. The prognosis was very poor. Leyland Robinson [1] gives 13 deaths out of 16 cases of auricular fibrillation following parturition, and G. J. Langley [2] gives one death out of three cases, while the other two responded badly. Many other authorities quote statistics, but do not fully differentiate the types of cardiac case. A search of the literature revealed no case of recovery of severe auricular fibrillation when complicated by broncho-pneumonia. Lastly, the case seems to afford a convincing argument in favour of large doses of digitalis in the treatment of auricular fibrillation. Although the patient never had any blood infection, she was seriously ill from pelvic sepsis, and hæmolytic streptococci were found in her cervical canal. In addition, there had been a breakdown in the cardiac mechanism on at least one previous occasion, auricular fibrillation had been present for at least four days before the treatment was initiated, and there was a fairly marked degree of broncho-pneumonia. It is therefore all the more remarkable that, within 12 hours of the administration of this large dose, fibrillation ceased, and no apparent cardiac irregularity could be detected until 12 hours afterwards, although the pulse-rate was taken at the apex at half-hourly intervals during most of that period.

The patient, aged 41, was sent into Monsall Hospital on March 5th, 1927, by Dr. L. J. Shaw with a diagnosis of puerperal pyrexia. She had had an apparently normal confinement on Feb. 23rd, ten days previously. She had had auricular fibrillation and broncho-pneumonia for two days before admission. There had been three previous confinements and two miscarriages. There was also a history of rheumatic fever in 1902 and 1910, and of a breakdown in the cardiac mechanism with associated œdema following the previous confinement.

Condition on Admission.—The patient was extremely cyanotic and collapsed, with a typical irregular pulse. She had a troublesome cough with frothy mucopurulent sputum, but there was no hæmoptysis. There were definite signs of broncho-pneumonia at both bases, especially on the left side. The possibility of pulmonary infarcts was ruled out, as the two lungs appeared to be symmetrically affected. There was a definite pleuritic friction rub in front of the area of the apex impulse. The apex-beat was just outside the nipple line and the first sound was completely replaced by a murmur, while there was also a well-marked diastolic murmur. There was a very definite increase in hepatic dullness. The urinary output was extremely low, with slight albuminuria. There was marked tenderness in the lower abdomen. The uterus was fairly well involuted, but with marked bilateral parametric infiltration. There was a little sanious and slightly offensive leucorrhœa.

On the following day there was a definite improvement in the rhythm of the pulse, but the rate remained irregular. A culture from the cervical canal revealed hæmolytic streptococci, but a blood culture proved sterile. On March 7th the condition of the patient was precarious. It was decided to use Eggleston's method of massive digitalis administration,[3] the large dose being indicated by

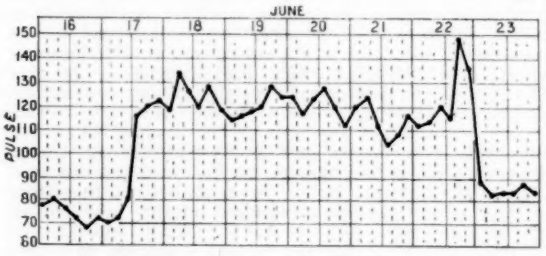
[1] THE LANCET, 1927, i., 170.
[2] Brit. Med. Jour., 1927, i., 1043.
[3] Jour. Amer. Med. Assoc., 1920, lxxiv., 974.

the complete cardiac breakdown with orthopnœa and other complications. The basis of calculations of dosage is 0·15 c.cm. of the tincture of digitalis per pound of body-weight. Unfortunately, the body-weight and the allowance for previous dosage (approximately gr. 1/60 digitalin every four hours for three days) could only be roughly estimated. Fortunately the early toxic symptom of vomiting could be relied on to protect the patient from an overdose. After some trepidation 250 minims of a tincture of digitalis of known potency was administered, without subsequent vomiting.

On the following day the patient was much more comfortable, the pulse varied between 110 and 90, and was 100 per cent. improved in volume. There was only occasional cardiac irregularity (two or three irregular beats followed by 10 to 12 regular ones) and there was a definite typical rough, presystolic murmur. The pleurisy was not spreading, and the broncho-pneumonia improved on the right side, but remained about the same on the left. The sputum became nummular and less frothy. The urinary output increased from 25–50 oz.; there was still a good deal of offensive leucorrhœa.

On March 9th the patient's colour had improved markedly, and the pulse was of excellent volume, and only very occasionally irregular. The presystolic murmur was not nearly so obvious. The broncho-pneumonia on the right side had apparently gone, while the left lung was much clearer. There was no trace of any pleurisy. The cough was less troublesome and the sputum still nummular but less frothy. The urine was clear, but there was still a fair amount of sanous offensive leucorrhœa.

On March 11th the pulse was absolutely regular, with a rate of about 70. There was still a small patch of tubular breathing over the left lower lobe posteriorly. On March 15th, one week after the administration of the dose, it was realised that its beneficial effect had reached a maximum, but, as the pulse remained regular at 70–80 and the urinary output remained about 66–70 oz., the patient



Pulse chart including the period June 17th–23rd during which the patient had auricular fibrillation.

was allowed up, without ill-effects. Five days later the pulse became slightly irregular, and the patient was put on tinct. digital. ℥ v. t.d.s. This was increased on March 22nd to ℥ xv. t.d.s. During this period the inflammatory conditions in the pelvis were gradually settling down, and on March 30th the offensive leucorrhœa ceased.

On April 8th the patient was discharged. She had a well-marked presystolic murmur, and the apex-beat was in the nipple line. The pulse-rate was between 80 and 100, but absolutely regular, and the patient's exercise tolerance was better than it had been for the last 15 years. The pelvic organs were healthy, except that the uterus was pulled over to one side of the vertical axis. The lungs appeared normal, but the liver still extended down to near the umbilicus, being partly enlarged and partly ptosed. Digitalis, once utilised, must be continued,[4] so the patient was referred to the cardiac clinic at Ancoats Hospital, where Dr. G. J. Langley found mitral stenosis, stage II., with definite murmur and thrill, but without fibrillation. An electrocardiogram taken on April 8th shows normal rhythm of the heart with the auricular waves clearly marked and the spacing regular.

One month later she was much worse, being cyanosed and dyspnœic. Her auricle was fibrillating at 120 per minute and was grossly irregular. A full diastolic rumble was still present, but no presystolic thrill could be detected. She was admitted on May 31st for observation. Her heart remained regular until the period for which the temperature chart is shown, when her auricular fibrillation became spasmodic in type. She had a sudden onset of auricular fibrillation at 10 A.M. on June 17th, and four hours later her pulse had risen to 120. In an electrocardiogram taken on this day the auricular waves have disappeared, the rhythm has become completely irregular, the ventricular complexes are unequal in size, and the usual undulations of fibrillation are visible in lead III. She remained in this condition until June 22nd at 10 P.M., when 13 tablets, each equivalent to 1 c.cm. of tincture of digitalis, were administered. The rate fell from 150 (after atropine release) to 72, at 4 A.M. on June 23rd, after which it remained regular until discharge (see chart).

Digitalis, although fully competent to control auricular fibrillation, has no power to reinstate a normal rhythm, and the accompanying chart gives the explanation, the onset and offset of the tachycardia due to auricular fibrillation being absolutely sudden and spontaneous.

In conclusion, I wish to express my indebtedness to Dr. D. Sage Sutherland, medical superintendent, Monsall Hospital, Manchester, for permission to publish this case; and to Dr. G. J. Langley, physician to Ancoats Hospital, for permission to utilise his notes of the subsequent history of the case.

[4] Mackenzie: Diseases of the Heart, 4th edition, p. 205.

A CASE OF NERVE PALSY.

By NATHAN WALSH, M.B., CH.B. LEEDS,
PUBLIC VACCINATION AND DISTRICT MEDICAL OFFICER, SCARBOROUGH UNION.

THE following case is, I think, worthy of record.

A labourer, aged 32, gave a history of pain in the outer side of the left leg occurring during a game of football, but not referred to any definite injury during the game. He says his "knee gave way," and this was followed by a dull pain which was not severe. He finished the game and walked home without much discomfort. The pain became worse and he was seen the following day.

When examined, the outer side of the left leg, about 2 inches below the head of the fibula, was red, swollen, stony hard, and tender. Pain was also present on the dorsum of the foot. There was no sign of bone injury. He was unable to dorsiflex his ankle or to abduct his foot. He thus had "foot-drop," the muscles chiefly affected being the peronei and extensor digitorum longus. There was no wasting and no loss of sensation. The X ray showed no abnormality. The only diagnosis was palsy of the anterior tibial nerve, due to rupture of fibres either of the peroneus longus or extensor digitorum longus, with a deep hæmatoma compressing the nerve, either as it passes between the head of the fibula and the peroneus longus or as it passes beneath the extensor digitorum longus. Under massage and electrical treatment he is slowly improving. It is surprising that he had so little pain with such a marked lesion.

My thanks are due to Dr. J. R. Dick, hon. surgeon to Scarborough Hospital, for the X ray examination.

A CASE OF
CYSTIC PNEUMATOSIS OF THE BOWEL.

By J. SILVERSTONE. M.B. LOND., M.R.C.S. ENG.,
SENIOR HOUSE SURGEON, NORTH STAFFORDSHIRE ROYAL INFIRMARY.

THIS condition was the subject of the presidential address delivered by Mr. Cyril A. R. Nitch before the Section of Surgery of the Royal Society of Medicine in November, 1923.[1] The disease is analogous to intestinal emphysema of swine. In these animals it is the rectum, jejunum, and mesentery which are most commonly affected, and the disease is seen chiefly on the mesenteric border. In pigs it is always associated with an intestinal catarrh. In man the disease is rare, only about 85 cases having been previously recorded. It is associated with constipation, and usually there is an organic stricture of some portion of the intestinal tract. It has invariably been discovered either at operation or at post-mortem examinations. The commonest coexistent lesion is either gastric or duodenal ulcer, and of these about 83 per cent. have shown stenosis.

[1] British Journal of Surgery, 1924, xi., 714.

Males are affected in the ratio of three to one, and the ages range between 13 and 60 years. It is seen most often in the ileum, near its termination on the anti-mesenteric border, but it may affect any other part of the intestinal tract, most rarely the rectum, duodenum, and appendix. The large bowel is frequently involved, the disease stopping at the splenic flexure. As a rule, the bowel is affected for a considerable distance, but the disease may occur in isolated groups separated by normal bowel. The cysts are usually sessile, but may be pedunculated; they are situated in the subserous and submucous layers and are seldom seen either in the muscular coat or mucosa. They rarely communicate with the lumen of the bowel or with each other.

Histologically, there is an endothelial lining containing a number of giant cells (suggesting chronicity). Small round cells and other signs of inflammation are absent. There is a chronic hyperplastic endolymphangitis, which suggests that the condition is one of gas-containing spaces formed in the lymphatics, rather than clefts in the connective tissue.

Cultures from fresh specimens have been negative. The gas consists of a large percentage of nitrogen, as well as oxygen, carbon dioxide, and a little hydrogen. Second operations have shown that the cysts disappear spontaneously, leaving a typical cicatrix.

The theories of causation, as investigated in swine, are three in number.

1. *Bacterial.*—Jaegar cultivated what he believed to be a specific organism, *Bacillus coli lymphaticum aerogenes*, which entered the submucous lymphatics through a chronically inflamed mucous membrane.

2. *Hæmatogenous.*—John Hunter suggested that the gas escaped from the blood, either from natural causes or through diseased blood-vessels.

3. *Mechanical.*—The gas being forced into the intestinal wall through an abrasion in the mucosa.

The absence of signs of inflammation, the fact that there are no adhesions nor lymph, and also that no specific organism has been cultivated in man, all tend to disprove an infective origin. The majority are due to mechanical causes. Air enters through an abrasion in the mucous membrane and so gains the lymphatic network, and is driven along by constant pressure and by peristalsis. The irritation of the gas leads to an obliterating endolymphangitis, and so cysts are formed. The constant pressure and high tension of the air are maintained by the vomiting and flatulence of the associated lesion (ulcer).

The cysts are best left alone, as they tend to disappear spontaneously. Crushing or puncture is dangerous, as the bowel may perforate from the resulting weakness.

On Sept. 5th, 1927, a sparsely built man, aged 40, was admitted to the North Staffordshire Royal Infirmary with the following history.

He had complained of "indigestion" for years. This took the nature of pain in the epigastrium immediately after food, followed by vomiting, which relieved the pain. There was no hæmatemesis. The usual remissions were present; the appetite was fair, and he was not losing weight. He suffered from constipation. At 6.30 A.M. that day he was getting dressed, when he had a sudden pain in the epigastrium. He vomited and collapsed, and was brought to hospital.

Examination revealed obvious signs of a perforated gastric ulcer. He was operated upon by Mr. Reginald Alcock. On opening the abdomen much slightly turbid fluid was found. There was a perforation on the anterior surface of the stomach about 1 inch from the pylorus. This was surrounded by a large area of induration, rendering oversewing of the ulcer difficult. Further examination showed a curious condition in a loop of small intestine. For about 9 inches the gut seemed to be replaced by vesicles containing air or gas. Some of these were punctured, but no fluid escaped. A little further on were two small buds of the same cystic nature, about the size of a cherry. Excision of the loop was inadvisable, on account of the serious condition of the patient. A lateral anastomosis was performed and the abdomen closed with drainage in the usual way.

The patient was expected to perforate at the site of the vesicles and die, but he made an uninterrupted recovery, and left the hospital seemingly fit. He returned, however, complaining of incessant pain and vomiting, so was readmitted for a gastro-jejunostomy.

On Nov. 29th, 1927, he was again operated upon by Mr. Alcock. The induration causing pyloric obstruction was still present, so a post-gastrojejunostomy was performed, and the appendix was removed. The site of the lateral anastomosis was slightly adherent, but there was no trace whatsoever of the vesicular condition, the bowel being roughened and cicatrised. The patient is still in hospital, and is progressing very satisfactorily.

I am indebted to Mr. Alcock for permission to publish this case.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF LARYNGOLOGY, MEDICINE, AND ODONTOLOGY.

INFLUENCE OF NASO-ORAL SEPSIS ON THE LUNGS AND GASTRO-INTESTINAL TRACT.

THESE combined Sections met on Jan. 11th to discuss the above subject, Mr. HAROLD BARWELL (President of the first-named) being in the chair.

The Laryngologist's Point of View.

Mr. E. D. DAVIS said that laryngologists were still somewhat backward in calling in the aid of the physician, and he hoped that the discussion would encourage them to regard the patient's condition as a whole as well as the region of their own specialty. Nasal sepsis could influence the lungs and lower respiratory tract (1) by direct extension of inflammation to the larynx, trachea, and bronchi, or by the blood and lymph streams; or (2) by aggravating or increasing existing pulmonary lesions; or (3) the nasal sepsis might be part of the general infection involving the upper and lower respiratory tract. Direct infection to pharynx, larynx, and trachea was seen in the common cold. A pneumococcal infection of the nose and nasal sinuses might precede or accompany pneumonia. A. R. Felty and C. A. Heatley, investigating the causal organism of lobar pneumonia in 16 cases, showed that pneumococci of corresponding type occurred also in the patients' nose; and in five were also found in the blood. When there was profuse suppuration in the nasal sinuses, the pus streamed down from under the soft palate and collected in the lower pharynx below, behind the arytenoid cartilages, and in the pyriform fossæ. This pus was always swallowed, and he had never seen it in the larynx or trachea, though he had frequently searched for it; its entry was prevented by the ciliated epithelium and by the cough-reflex. The cleansing power of the trachea was enormous, and experimental attempts to produce pneumonia by introducing cultures into the naso-pharynx failed unless large doses of a high virulence were used. Still, a direct spread of the inflammation to the larynx and trachea often accompanied nasal suppuration, and was helped by the coughing and hawking. Investigations in America showed that infection could extend by the lymphatics to the chest. When an inflammatory condition of lungs already existed it was certainly aggravated by nasal sepsis, and tuberculous patients had no resistance to pyogenic and catarrhal infections. Suppuration in the sinuses sometimes followed bronchiectasis and bronchitis.

Looking through the notes of 100 of his cases of nasal sinus suppuration, Mr. Davis found that in 90 the infection was confined to the nose, whilst there were four patients with bronchitis, one with bronchiectasis, two with asthma, one with abscess of the lung, one with colitis, and one with duodenal ulcer. It was likely, however, that some of the 90 patients would later have secondary pulmonary infections. Of 474 cases of definite pulmonary tuberculosis which

he had investigated at Mount Vernon Hospital, only five showed nasal sinus suppuration, but there were 11 with atrophic rhinitis and five with nasal polypi without suppuration. It was difficult to prove that chronic suppuration in the sinuses was a cause of bronchiectasis; but Dennis reported 24 cases of bronchiectasis in which the condition was present, being improved in 16 by treatment of the nose. In his own experience gastro-intestinal infection arising from the nose was rare. Septic teeth, he thought, were more likely to affect the gastro-intestinal tract than was nasal sepsis. A case of chronic suppuration of the nasal sinuses should be regarded as a potential pulmonary case, and general as well as local treatment should be started.

Mr. C. A. S. RIDOUT said that children were often sent to his clinic from the municipal tuberculosis clinic, who had general debility with bronchial signs, such as crepitations, possibly with night sweating and enlargement of cervical glands, but in whom no tubercle bacilli had been found. All these patients had enlarged and infected tonsils and adenoids, generally they had marked dental caries, and some had infection of the antra of Highmore. With attention to the local seats of sepsis the chest condition usually cleared up. These cases showed the importance of every tuberculosis clinic being in a position to consult with a laryngologist and otologist. The relationship of gastric ulcer to nasal and oral sepsis also required more team-work between the surgeon, physician, laryngologist, and dental surgeon than had been usual. He had done a considerable amount of general surgery, and had constantly noticed that oral sepsis was associated with such conditions as gastric ulcer and carcinoma. Probably there was in the stomach an early stage, before an ulcer formed, at which the aid of the laryngologist might well be all-important.

The Medical Point of View.

Dr. R. A. YOUNG began by paying a warm tribute to the pioneer work of Dr. William Hunter on dental and oral sepsis. It was difficult, he said, to find a satisfying definition of sepsis, but, for the purposes of this discussion, it could be taken to mean the conditions produced by local infections with pyogenic organisms. Hence the chief conditions to be discussed were those of streptococcal origin, and in these infections bony structures were very apt to be involved. There were at least six ways in which local sepsis of mouth, nose, and pharynx might affect the respiratory mechanism: (1) By direct spread along the mucous or submucous tissues. (2) Mechanically, by the nasal obstruction preventing the filtering and warming functions of the nose, and thus leading to catarrh of air passages and alveoli. (3) By the inhalation of septic organisms derived from the nose or mouth, leading to infective conditions of the bronchi or lungs, or by particulate inhalation, especially when there was widespread ulcerative disease, or when the patient was unconscious, as during anæsthesia. For all operations there should be the strictest hygiene of the mouth. (4) Indirectly, by toxic absorption influencing the blood and immunity of the patient, such an influence being apparent wherever there was long-continued sepsis. Sometimes there were also indications of endocrine exhaustion, as shown by lowered blood pressure and appearances of mild hypothyroidism in patients with advanced oral sepsis. (5) By septicæmia or infective endocarditis originating from oro-nasal sepsis. Lastly, there might be (6) a painful fibrositis of the muscles of the thoracic cage, leading to pleurodynia. Dr. Young concluded by considering the chief clinical results of these processes, including laryngitis, bronchiectasis, pneumonia, gangrene of lung, and tuberculosis, and said that if the discussion impressed on those concerned with treating respiratory diseases the necessity for attending to abnormal conditions of the mouth and nose, it would have served a useful purpose.

Dr. IZOD BENNETT said that conclusive proof of the dependence of gastro-intestinal disease on sepsis higher in the alimentary canal was not yet forthcoming. Much of the evidence now available, however, pointed so clearly in one direction that even now some dogmatism was justified. There were two paths by which bacteria or their toxins could affect the stomach and lower intestinal tract: (1) by the swallowing of bacteria and pus, and (2) by direct passage into the blood stream of pathogenic organisms arising in the teeth, tonsils, naso-pharynx, or sinuses, with consequent appearance of embolic phenomena in other parts. He did not regard the swallowing of bacteria and pus from the teeth, nose, and mouth as so frequent a cause of gastric and intestinal disease as was formerly supposed. It must be remembered that many organisms were habitually ingested with food. Danger seemed specially to be present when the swallowing of pus was coincident with achylia. With regard to the second path of pus, many thought that infection via the blood stream was the commonest cause of gastric and duodenal ulcer. In 1922 Dr. Newton Pitt had shown that despite surgical and medical advances, the number of fatal cases of peritonitis following perforation of gastric and duodenal ulcer rose from nil in the five years, 1880–84, to 111 in 1915–19. Was this related to an increasing prevalence of sepsis in the mouth and throat? He believed that in all sections of society it was an everyday occurrence for dental surgeons to take measures for the preservation of teeth, whose pulp was infected, instead of extracting them, as was the former practice. Could such teeth be regarded as subsequently free from all sepsis? He considered that the filling of devitalised and artificially anæsthetised teeth was contrary to the accepted principles of the surgery of bone disease. The practice might bear a relationship to the increase of gastric and duodenal ulcer, cholecystitis, and appendicitis.

The Dentist's Point of View.

Mr. J. G. TURNER said that the evil influence of naso-oral sepsis was beyond doubt. He quoted four striking cases of gastric and intestinal trouble of marked degree which were cured by removal of all offending teeth. The smell of most mouths was due to stagnating material, chiefly food made from finely-ground flour, among the teeth, which had been made putrid by bacteria. Sticky food would only lodge where a resting-place had been provided or prepared for it. He agreed with Dr. Bennett's suggestion that ill-executed dental work and over-conservatism in respect of dead teeth were responsible for a large amount of illness. Pus and putrid material might inhibit the secretion of gastric juice. Some patients vomited septic material which had remained unaltered during its residence in the stomach. Could a man, he asked, immunise himself against his own dental sepsis? In the mouth the clinical answer was in the negative.

Mr. A. BULLEID said it was difficult to be certain that the bacteriological findings in cultures revealed the causal organisms of the disease under investigation, because the organisms isolated did not differ markedly from those in the healthy mouth. Agglutination was the most satisfactory of serological reactions. Infections of the nares and naso-pharynx were more easily investigated, as in health the secretions were normally sterile. All chronic pulmonary infection was benefited by eradication of naso-oral sepsis. Bacteriological examination of the sputum and of material from naso-oral foci should always be carried out when such infection was present, as prophylactic vaccination subsequent to the medical treatment of the lung condition was of great importance. He discussed the significance of the *Leptothrix buccalis* group of organisms in relation to the formation of tartar on the teeth.

Discussion.

Dr. F. A. PICKWORTH (Birmingham) sent a contribution, which was presented by Mr. Davis. It related a case of diplococcal infection of the sphenoidal sinus, with associated hæmorrhages in the stomach. The patient was a man, aged 62, who was

insane, and had a five years' history of epilepsy. The Wassermann reaction was negative. The bony walls of the sphenoidal sinus were remarkably thick, and the membranes of the sinus on both sides showed hypertrophy. The gastric mucosa showed regular surface hæmorrhages. Microscopically the sinus epithelium was invaded by numerous cocci. Even in the gastric epithelium there were cocci of similar character to those in the sphenoidal sinus. In addition the organisms were found in the pituitary capsule and gland.

Dr. P. WATSON-WILLIAMS (Bristol) spoke of the value of the work being carried on at Birmingham University by Dr. T. C. Graves and Dr. Pickworth, especially in the subject under discussion. In 1921 he, Dr. Watson-Williams, published a paper calling attention to the frequency of appendicitis owning, apparently, nasal sepsis as its cause. These were cases of great chronicity, and it was chiefly in latent cases, in which but little pus was evident, that systemic manifestations were found; they were apt to be overlooked unless carefully searched for. He quoted a number of typical cases. He pointed out that the greatly increased frequency of gastric, duodenal, and appendicular troubles since 1889 synchronised with the epidemicity of influenza.

Dr. E. STOLKIND said that even when the teeth had been removed it did not always follow that the secondary disease cleared up. Among many patients with digestive and pulmonary disease, very few reported improvement after extraction of their teeth, and he considered that the close relationship between disease of teeth and lungs and gastro-intestinal tract had not yet been proved.

Sir JAMES DUNDAS-GRANT spoke of the frequency with which it was found that cases with pulmonary tuberculosis at Brompton Hospital improved unexpectedly when the nose was washed out with a prescribed lotion. Sometimes suppurative disease of the naso-pharynx produced a form of laryngitis very difficult to distinguish from tuberculosis. He had seen the vocal cords coated with a greenish crust of pus which had obviously found its way there from an infected sinus. Washing out of the nose greatly improved the throat condition. He felt sure that occasionally bronchiectasis was caused by sinusitis.

Dr. T. A. CLARKE said he felt convinced that oral and nasal sepsis was a frequent cause of spasmodic dysphagia. In nearly all the 200 cases of carcinoma of the œsophagus which he had investigated dental sepsis was present, in many advanced. Even in these cases attention to the sepsis temporarily improved the swallowing.

Mr. A. F. MACCALLAN spoke of ocular indications that general resistance of the body was giving way because of the action of chronic sepsis, chiefly in teeth, tonsils, or colon. Since last May he had seen 74 in which indications of this kind were present. Although 90 per cent. of them had 6/6 vision, there were conditions such as blepharitis, and the slit-lamp revealed slight opacities in the periphery of the lens and in the vitreous, seen when the pupil was dilated, and also hyperæmia of the macula. He advocated a more frequent ophthalmic examination of patients to ascertain their resistance and how far the disease had progressed.

Dr. W. HILL did not think that pulmonary, gastric, and intestinal disease often resulted from focal disease in the nose, though he granted that a relationship had sometimes been clearly established in frankly suppurative cases. Fœtor of itself was not necessarily an indication of the presence of pathogenic micro-organisms.

Mr. CYRIL HORSFORD declared that in his own experience there were a large number of cases of gastro-intestinal disease which were directly due to infection of the nose and throat. Treatment of infections of antra or sinuses sometimes cleared up the gastric condition when the usual treatment proved unavailing.

RECEPTION AT THE ROYAL SOCIETY OF MEDICINE.

SAINTS, MEDICINE, AND SURGERY.

A LARGE company of Fellows and guests attended the reception at the Royal Society of Medicine on Jan. 16th, when Dr. JANE WALKER delivered an address on medical saints. It had been a real difficulty, she said, to choose a title which would exclude those very many medical men and women who had been so full of grace and holiness as to merit the term "saint." She proposed to limit herself to those Christian Saints who had been concerned in the medical and surgical details of the profession of healing and, indeed, to the best known and most important among them, for their total number was very great. Of some, for instance St. Conrad, patron of sufferers from hernia and rupture, she had been unable to find any pictures. Saints, she pointed out, were represented by the old masters as patrons of individuals or of cities, but as time went on there was a tendency for the donor of the painting to increase in size and sanctity at the expense of the saint. In the van der Goes "St. Victor," shown at the Glasgow Gallery, the donor was quite as large as the saint and dressed in monkish garb. A good example of a saint as patron of a city was found in the Mantegna St. George, patron saint of Venice, as well as of England. Saints were also depicted, however, in their rôle of protectors against, and supporters of sufferers from, disease. Of these the first was St. Luke. Modern criticism tended to deny to the third evangelist any medical status, but Dr. Walker pointed out that it was very like a doctor to omit, in describing the incident of the woman who had had an issue of blood, the remark, supplied by Matthew and Mark, that she had spent all her living on physicians and was no better but rather worse. It has been suggested that St. Thomas, who was an honest sceptic, though a reverent one, would be a better patron saint for doctors than St. Luke. In Dr. Walker's opinion the third gospel showed many signs of medical knowledge, for instance, the reference to Peter's wife's mother when she was holden with a "great fever," a recognised diagnosis in those days. St. Luke was the patron saint of artists, and himself a painter. It was while sitting to him for a portrait that the Virgin was supposed to have told him all those intimate details of the early life of her Son which are found in no other narrative. A picture by Dieric Bouts, on view at the Academy last year, showed St. Luke painting this portrait. Next in importance to St. Luke was St. Pantaleone. He was said to have been very beautiful and of graceful manners, and a high favourite with the emperor. He had been tied to an olive tree and beheaded, and an olive had sprung up where the head fell, so that he was generally represented wearing the long robes of a physician and holding an olive branch. St. Cosmas and St. Damian would be the subject of another lecture to the society later on, but Dr. Walker could not resist showing the picture representing St. Damian's one lapse from grace in the matter of fees. An importunate widow presses on him a money-bag which he sternly rejects with the right hand whilst receiving it into his left. "Characteristic attitude of a physician refusing a fee" observed the lecturer as the reproduction was thrown on the screen. St. Cosmas had been so incensed with his twin for this sin that he had declared that they should not be buried in the same grave. The story ran, however, that when the second grave was being prepared, a camel had arrived, with tears streaming from its eyes, and announced that it represented all the animals who had been healed by these good men. It had begged that they should not be separated in death. In showing the well-known picture of the graft of a dead Moor's leg on to the amputation stump of a man with a cancer of the shin, Dr. Walker drew attention to the scars of the cautery on the head of an onlooker, to the "septic dog" in the foreground, and to the stupefied expression of the patient. Narcotics were seldom

mentioned, she said, because they were so very common in those days.

Three Virgin Martyrs.

St. Margaret was the patron saint of pregnancy because she had come out of the mouth of the dragon, from all time an emblem of danger. She was often represented with the dragon at her feet, still clasping in his jaws a portion of her robe. A beautiful van Eyck in the National Gallery represented a husband presenting his wife to his family. That she was intended to be pregnant and that her pose was not merely the fashionable one of the time was proved by the presence of the little statue of St. Margaret on the bedpost. An interesting painting was the "Nativity" of Petrus Christus, where St. Joseph was shown with a candle ushering in a midwife—too late to do aught but adore. This feature, Dr. Walker believed, never appeared in southern works of art. St. Catherine, of Alexandria, had been a great orator and was patron saint of the tongue and of learning. She was represented, teaching, in a picture by Goosen van der Weyden, and, since she had been a princess, she was always shown wearing a crown. Her father had considered her too wonderful for any human mate, and hence had arisen the legend of the mystic marriage, represented by many painters, for instance Bernadino Luigi. She had been tortured on four wheels revolving in different directions, but the wheels had been miraculously smashed and she had therefore been beheaded. Her body had been carried by angels to Mount Sinai. St. Barbara was the patron saint of sufferers from accidents and explosions. Her father, also, had considered her too beautiful for mortal eyes to look upon and had therefore imprisoned her in a tall tower, which became her emblem. She had asked for three windows instead of the two he had planned, remarking that light came to the soul through three windows. He had thence concluded that she must be a Christian and had attended to her tortures himself, finally cutting off her head. Among the painters of Barbara and her tower had been van Eyck and Holbein.

Plague and Pestilence.

St. Sebastian, born in Gaul in 288, had been a member of the Pretorian Guard and a favourite of the emperor, who had vainly urged him to deny his faith. The arrows were always shown sticking into non-vital spots, and he had, in fact, recovered from them to die from beating with clubs. Occasionally a picture mistakenly showed an arrow in a vital spot, as did the one in the Uffizi Galleries, Florence. The arrow had been the emblem of plague from olden time, as suggested by the text "the arrow that flieth by noonday." St. Roc, born in Montpellier with a small red cross on his breast, had made a pilgrimage to Rome in the course of which he had encountered plague and discovered his success in treating the sufferers. He earnestly hoped, said Dr. Walker, that he would get the disease himself, and in the end succeeded in acquiring the ulcer of the leg which his many portraits represent. The pain was so great that he cried out, and was turned out of the city and would have died in the forest had not his little dog daily fetched him a loaf. When he returned to his native city he was so thin and worn that nobody recognised him, and he was put to death as a spy. He left a document, however, revealing his identity and his significance for plague-stricken communities. Venice, being much subject to plague, decided that she could best do with his body, and therefore stole it and founded the well-known church and convent.

The Eye, Breast, Teeth, Stomach, Throat, and Lungs.

There were confused and obscure stories about St. Lucy, patron of the eyes and of the labouring poor. The later ones said that her lover had inordinately admired her eyes, and that therefore she had plucked them out and sent them to him. He had immediately become a Christian and her sight had been miraculously restored. In the end she had died through having her neck pierced by a sword. She was frequently represented with two eyes on a sort of skewer in her hand, as in the Bergamo in Rome. St. Agatha had been cast into a house of ill-fame, but as she had refused to live a life of infamy her breasts had been cut off. Painters varied in the amount they left to the imagination, but she generally bore her breasts on a plate in her hand. St. Apollonia had been commanded to worship a statue, but had instead exorcised the devil from it, so that the statue had fallen to pieces. The governor, enraged, had had all her teeth pulled out, one by one, and later she had been burned to death. Patron of sufferers from stomach-ache and allied disorders, St. Erasmus had been tortured by having his entrails wound off on a sort of winch. He was usually depicted with his bishop's mitre and a kind of spindle in his hand, representing his intestines. St. Blaise, patron of diseases of the throat and of woolcombers and wild animals, had been a Greek bishop in the time of Diocletian and had cured a child who was being choked by a fish-bone. He had been scraped to death with large iron combs, very like the implements of the modern woolcomber. St. Ansano had been baptised at the age of 12 and had escaped from the persecution of Diocletian to Siena, where, however, the proconsul had seized him and, having failed to burn him, had cut off his head. Pictures showed him holding his lungs and liver in his hands, and he had become, for no known reason, patron of consumptives. St. Catherine of Siena, born in 1380, had desired the religious life from her infancy, but her father had only given his consent after finding her praying with a dove on her head. She had tended the sick, but had died at an early age and cramped her usefulness by excessive privation. She had been a woman of great strength of mind and body, and had been responsible for sending the Pope back to Rome from Avignon. She was portrayed wearing the habit of the Dominicans and holding a lily.

The vote of thanks to Dr. Walker, proposed by Dr. Percy Smith, included also the Wellcome Historical Medical Museum and Miss Marie Leon, who had lent many of the exhibits which were thrown on the screen and put on view in the library.

SOCIETY OF BRITISH NEUROLOGICAL SURGEONS.

THE third meeting of this Society was held in London in December last. Sir Charles Ballance, retiring from the Presidency, was made Hon. President, and Mr. Wilfred Trotter was elected President. It was announced that Dr. W. W. Keen (Philadelphia) had been made an Emeritus Member and Prof. Harvey Cushing (Boston) and Dr. C. H. Frazier (Philadelphia) Honorary Members.

Mr. H. S. Souttar operated at the London Hospital, using his craniotome, and cut a large frontal flap under local anæsthesia in an exploration for a para-sagittal cerebral tumour. He afterwards demonstrated cases and apparatus. The later proceedings took place at the Institute of Anatomy, University College. Prof. Elliot Smith reviewed some of the commonly neglected points in intracranial anatomy of interest to the neurological surgeon, referring to the work of Dr. Harris on the development of the diploe, to the course of the abducens nerve, and to his own work on the visual area and the relations of the carotid arteries to the optic chiasma. Papers were then read by Mr. L. R. Broster on a Case of Suprarenal Virility with Operative Findings, by Mr. H. W. B. Cairns on the Effect of Trauma in Disclosing New Clinical Signs in Neurological Cases, and by Mr. Julian Taylor on the Nature of Bone Invasion and Proliferation in Cases of Meningeal Tumour. A discussion on the Surgery of Head Injuries followed. It brought to light a very general conservatism with respect to early operation except in cases where a localised hæmorrhage could be diagnosed, and (of course) in cases of penetrating wounds.

The following morning was devoted to the display of patients by London members, and to a demonstration by Dr. H. A. Harris, of preparations in the Museum of the Institute of Anatomy, University College.

HUNTERIAN SOCIETY.

ON Monday last, Jan. 16th, this Society met in the Mansion House, with Mr. A. MORTIMER WOOLF, the President, in the chair, to hear Dr. HOWARD KELLY, of Baltimore, deliver the Hunterian oration for the year. Dr. Howard Kelly reviewed in his paper the whole history of surgery, taking as his text the Hippocratic maxim τριβὴ μετὰ λόγου, which he wittily translated

"GRUBBING WITH REASONING."

These three words had been, he said, the guiding principle of surgery and her sister medicine all through the ages. In the pursuance of this ideal surgery had grown apace; in its neglect she had lost her vision and become for a time dishonoured. He was indebted to Sir Clifford Allbutt, who, quoting these three master-words in 1904, had completely transformed his outlook on the history of surgery. Whereas he had been used to view the development of surgery as a slow, blind, evolutionary accretion, governed only by the one critical standard of a knowledge of anatomy, he now saw its history perfused with a new light and an abiding interest, and the whole of its past ruled by one glorious principle. This great maxim, "rubbing with reasoning," had been indispensable to progress of all kinds throughout all the ages. Τριβή was the rub and wear of daily contact with facts; "grubbing" expressed its essential meaning even better than "rubbing." Λόγος was the idea, man's supreme gift of cogent reason. Τριβή was the phenomenon, λόγος the noumenon ever shimmering behind the phenomenon in all Nature. When τριβή ruled λόγος, the light went out and men groped in the darkness of materialism; did λόγος lord it over τριβή, superstition and vagaries entered, bringing disorganisation. When, however, the two were wedded by the conjunctive μετά, their progeny was true science. This trilogy had been imparted to mankind by our remotest ancestor, to govern surgeons in all their ways at the birth of their craft. Applied to the history of the 70 generations from Hippocrates to Hunter it became a talisman revealing progress and uncovering the ways of error.

The Adolescence of Surgery.

The stream of medical knowledge had its source in a man who was perhaps the greatest physician of all past time, and who established medicine on a broad scientific basis with high ethical ideals.

Hippocrates' treatise on fractures and dislocations, joints, and chronic ailments was comparable with recent work, and his care of the wound left little to be desired before the era of Lister. He anticipated healing by first intention in fresh wounds, boiled the water used for washing, and ordered the cleanliness of the operator's hands and nails. Treatment had at first been largely hygienic and empirical; the Greeks, as Garrison noted, used not so much to cure as to prognosticate. Modern surgery owed to the Coan sage the example of the open mind, the alert, cultivated use of the faculties, and the habit of utilising experience.

Hippocrates had bequeathed his Aladdin's lamp of personal experience and judgments to be rubbed by generation after generation, but with it he had unfortunately handed down a λόγος, in the shape of the inherited humoral doctrine, which had escaped the discipline of τριβή. Surgery had therefore advanced slowly for the next 500 years, although it had received material aid from the Alexandrian school, whose anatomy had been summarised by Celsus in his "De Re Medicinâ."

The next great landmark was Galen, the speculative philosopher, the peripatetic physician. Galen had resembled John Hunter in the catholicity of his interests, but had left "no good accounts of clinical cases, only miraculous cures" by polypharmacy. He had approved the Hippocratic words of wisdom, but had unfortunately lacked Hippocrates' modesty, and so had lost the talisman and held captive, by his autoschediastic lucubrations, a school of blind Galenists for over a thousand years. His dogmatism had produced a millennium of darkness that could be felt, and his fatal doctrine had been that a cart goes best if the horse is set to pushing it from behind—i.e., that theory should precede and control practice, and that τριβή should be wholly subordinate to λόγος. The mischief he had done was most evident in the treatment accorded to Copernicus, Brahe, Kepler, and Galileo in the sixteenth and seventeenth centuries, and in the astrology, alchemy, and demonology that flourished to the exclusion of surgery, which, relegated to the barbers, became literally barbarous.

Mediæval Struggles.

Towards the end of the twelfth century light had begun to return with a little group of humble men, "reared in base apprenticeships, not only illiterate but forbidden even the means of learning," who by τριβή μετὰ λόγου had zealously sought the truth and proclaimed it, sometimes in the despised vernacular. Roger (1180) had done many things besides suturing intestines over a hollow tube and using ligatures in hæmorrhage. Salicetus (1201–1277) had substituted the knife for the fiendish but widely used Arabian cautery; had divided nerves, and kept good case-histories. Lanfranc, his pupil, had become the titular head of French surgery. Theodore of Lucca (1206–1277) had been a zealous apostle of union by first intention, insisting "It is not necessary that pus should be generated in wounds." Henry de Mondeville (1260–1320) had been a vigorous opponent of tradition and had declared with vehemence that "God did not exhaust his creative power in making Galen." Henry had been "the last champion in his day of two causes: the solidarity of medicine and union by first intention—the second lost for 600 years." Mediæval surgery had ended with Guy de Chauliac (1300–1370) a virile, inquisitive spirit who had cast out the lingering "sorcery, jugglery, astrology, and mysticism," and whose "Chirurgia Magna" was a masterpiece of learned luminous writing. In opposition to Henry and Theodoric, he had held that the surgeon should actively insist that the wound proceed in the approved fashion through its numerous stages, from "coction" to complete cicatrisation.

Ambroise Paré.

Paré's name had stood deservedly pre-eminent in the records of the last 350 years, but the reason for this pre-eminence was not at first sight easy to understand. He had been a barber's apprentice of no scholarship, snubbed by his compeers and writing in the vernacular, but by sheer merit he had cast all his predecessors into the shade and towered above his ridiculous influential contemporaries. The cause lay not in his ligating of arteries, but in his innate greatness and nobility of character. Men had known him but to love, honour, and respect him, and so the indefinable aroma of his reputation, commingled with his great works, was as potent to-day as it had been 400 years ago. An indefatigable worker, he had been fortunate in having a vast war experience. His predecessors had exhumed surgery and set her on her feet; Paré had rehabilitated her and presented her at court and to the world. No surgeon had ever made a more effective conjunctive use of τριβή and λόγος, multiple experiences digested and coördinated by reasoning.

Between Paré and Hunter there had been few surgeon torch-bearers. After Richard Wiseman (1622–1676) there had appeared William Cheselden (1688–1752), and Percival Pott (1714–1788), the former the patron saint of lithotomists and the latter an original genius and writer of masterpieces; these had been John Hunter's teachers and worthy of their great pupil. Although there was a tendency to pass over this pre-Hunterian age as sterile, much had occurred in it that was of first-rate scientific importance. Anatomy had made notable advances during this interval, despite the lack of material (Dr. Howard

Kelly here interposed some entertaining stories of "body-snatchers"), but its three leading events had been Harvey's discovery of the circulation of the blood (1628), the opening-up of histology and physiology by Malphighi (1626–1694), and the foundation of modern pathological anatomy which was laid by Morgagni (1682–1771) in his eightieth year; not to mention Bonet's "Sepulcretum" (1679), a "pathological library" containing all the prime needs of the surgeon.

John Hunter, and After.

Genius, for effective expression, needed a favourable environment, and there had never been an age which teemed so richly with scientific promise as that into which Hunter had been born. Chemistry had been growing under the hands of Scheele, Black, Priestley, Lavoisier, and later Humphry Davy, whose mantle had fallen on Faraday. Geology was being moulded into a veritable science by such men as James Hutton, William Smith, and James Playfair. Hunter's own collection of fossils, bequeathed to Sir Richard Owen, were basic in English geology. In botany, mycology, astronomy, economy, mechanics, art, morals, and religion new life was also stirring. Thus the thrill of birth had been in the air, and surgery, though the Benjamin of the sciences, had proved no laggard.

The twin novæ, William and John Hunter, had been born in 1718 and 1728 respectively, and had each lived 65 years. John had spent his boyhood roaming abroad in the open, undisciplined by his parents and neglecting letters for Nature, which, however, had nursed him and taught him never-to-be-forgotten lore. At 20 he had been undecided whether to be a soldier or a surgeon, but his brother's established reputation had turned the scale. Three years' "grubbing" had made him, with his natural talent, a highly skilled anatomist and a qualified surgeon, and he had then entered upon a period of great fruitfulness—not as a soaring genius but as a true exponent of τριβή, or of his own maxim, "Don't think; try." The regeneration of the ancient art of surgery had dawned in the enthronement of the basic principles of hard work with fruitful hands and clarified vision, observation, and record. What would we not give, asked the speaker, for an ergograph of one of John's days? He had subjected himself to an exemplary and rigorous routine in the exploration of fields some of which were closely allied to surgery and some of which were not, and had pressed his labours to the end of his days, in spite of the Damoclean sword of an agonising and ultimately fatal angina. As well as becoming a great surgeon he had also made himself a master of zoology and geology, and the new art of taxonomy, based as it was on physiology, had interested him greatly.

Dr. Howard Kelly then reviewed the many important contributions of John Hunter to anatomy, pathology, surgery, and the allied sciences. His one deficiency had been that he was no encyclopædist of the work of others; he had failed to realise, like many before and after him, that a wide distribution of knowledge over many workers was likely in the end to accomplish more even than one great mind. The great century had therefore reached a fitting climax in the career of a man who had done more than any other to erect for surgery—that most beneficent of all human activities—the two imperishable pillars upon which, in common with all other science, it rested: the τριβή of skilful painstaking observation and accumulation of data, and the λόγος of highly trained reasoning, analysis, classification, and the coördination and abstraction of laws.

In the time of Hunter, however, surgery as it existed to-day had lain profoundly concealed in the womb of the future. In the absence of a new and transforming impulse an acme had probably been reached similar to that proclaimed by Michaelis, of Kiel, when, last century, he had performed on Frau Adametz her fourth Cæsarean section. That impulse, however, had been given, first by the pioneers of anæsthesia and cellular pathology, and most decisively of all by the hero who, working on the basic principles of John Hunter, had converted the reeking hospitals of his time into temples of health, sweetness, comfort, and happy associations; who had, in spite of opposition, ridicule, and obloquy, brought down heaven's greatest physical blessing and destroyed our direst enemies, the germs of wound infection. Such a man deserved, even more than the speaker's great countryman, Franklin, the encomium "Fulmen que eripuit cœlo, sceptrumque tyrannis." "Gentlemen," concluded Dr. Howard Kelly, "let us ever hold in highest honour the names of John Hunter and Joseph Lister."

In replying to a vote of thanks proposed by Mr. T. H. OPENSHAW and seconded by Dr. H. A. ELLIS, Dr. HOWARD KELLY presented to the Society an autograph letter of John Hunter for addition to their collection.

Reviews and Notices of Books.

EMERGENCIES OF A GENERAL PRACTICE.

Second edition. By the late NATHAN CLARK MORSE, A.B., M.D., F.A.C.S. Revised and re-written by AMOS WATSON COLCORD, M.D., Surgeon, Carnegie Steel Co.; Surgeon, Pennsylvania Railroad System. London: Henry Kimpton. 1927. Pp. 514. 42*s*.

THIS book is prepared with a view to assisting those general practitioners who are not in a position to send cases to a specialist, to deal with their emergencies as specialists would; it should make a special appeal to the doctor resident in rural communities and small towns or in the colonies. Originally written by Dr. Morse, it has been revised for its second edition by Dr. Colcord, who pays a glowing tribute to the original author.

After a short chapter on instruments and solutions required in surgical emergencies, there follows a useful chapter on the removal of foreign bodies from all parts of the body where they may lodge; the value of this section as a quick and handy source of reference need not be elaborated. A chapter on first-aid suggests requisites in first-aid boxes, and deals with the subject from the points of view of laymen, nurses, and physicians. Treatment of the drowning is fully described. An excellent section on carbon monoxide poisoning follows, in which it is laid down that CO is not a cell-poison but kills merely by deprivation of oxygen—a most important factor underlying the treatment. This section is particularly well illustrated.

Two chapters on surgical emergencies deal with Carrel-Dakin methods of wound-treatment, Dr. A. B. Kanavel's methods of treatment of infected hands and fingers, abdominal emergencies (described at some length), scalp wounds, and injuries to the eyes. Why icterus is included among surgical emergencies is not clear, especially as the operation of cholecysto-duodenostomy is not mentioned.

The discussion of certain medical emergencies is less satisfactorily dealt with; the treatment of hæmoptysis is too dogmatic, being based neither upon physiological nor statistical considerations; powdered alum, for instance, is recommended, and the nitrites are described as useless without further ado. Hæmatemesis is described as "frequently following severe injuries over the epigastrium"; most of the remedies suggested are given by the mouth, the advisability of keeping the stomach completely empty not being mentioned. The use of insulin in diabetic coma is discussed in five lines. There follows more useful sections on food-poisoning, burns, rabies, tetanus, and retention of urine.

Fractures receive 100 pages jointly with dislocations; this section is well illustrated; the methods recommended are evidently those of which the author has experience, and are mostly orthodox ones. A chapter on emergency amputations follows. The section on obstetric emergencies includes Cæsarean section, the use of forceps, and placenta prævia. In

each of these conditions the author gives us the principles which have guided him in a busy practice. Finally a 70-page section on poisoning from all kinds of sources completes the book; it includes many poisons not found in more compact handbooks, and should be useful for reference.

The book will not fail to interest those medical men who have to tackle their own emergencies. It represents the accumulated experience of at least two busy and varied lives, and contains many a useful hint that does not appear in more academic works.

ENZYMES.

Lehrbuch der Enzyme. Chemie, Physikalische Chemie und Biologie. By Prof. CARL OPPENHEIMER, Dr. phil. et med., in Berlin. Leipzig: Georg Thieme. 1927. Pp. 660.

THIS work aims at covering the whole ground of enzyme action from the point of view of a summary. The book, which is divided into two parts, starts with an account of the chemistry of enzyme action followed by an interesting chapter on the chemical nature of enzymes. An excellent summary of the recent work of Prof. Rich. Willstätter (Munich) is included, and might with advantage be expanded in a subsequent edition. The third chapter deals with factors influencing enzyme action in general. On p. 51 a useful table gives the optimum pH for the action of a very wide series of enzymes, the authority being quoted in each case. The action of neutral salts, various ions, and organic substances is discussed, and the antigenic properties of enzymes are also considered. The next chapter is devoted to the purely physical, chemical, and kinetic aspects of enzyme action, and is written in conjunction with Dr. Richard Kuhn. One of the most interesting parts of this section is the description of the methods of determining the isoelectric point of the various enzymes, which is omitted in most books. The section concludes with a brief account of the absorption phenomena in relation to enzymes. The final chapter of the first half of the book is concerned with the distribution and preparation of enzymes. This is dealt with in a general manner and includes an interesting section on the probable method of secretion of these bodies.

The second part of the book is divided into 16 chapters consisting of a summary of all the recent work upon special enzymes. Each chapter is devoted either to one enzyme, or to a group of similar enzymes. The summaries have been admirably made, few researches of any note having been omitted, and probably for this reason very few references are to be found, but a full bibliography would have been invaluable, and we hope it may be supplied in a future edition.

CONTROL OF ANOPHELES.

Mosquito Surveys: A Handbook for Anti-Malarial and Anti-Mosquito Workers. By MALCOLM E. MACGREGOR, Entomologist, Wellcome Field Laboratory, Wisley. London: Wellcome Bureau of Scientific Research. 1927. Pp. 282. 15*s.*

A Short Illustrated Guide to the Anophelines of Tropical and South Africa. By ALWEN M. EVANS, M.Sc., Lecturer in Entomology, Liverpool School of Tropical Medicine. University Press of Liverpool, Ltd. 1927. Pp. 54. With 12 plates. 9*s.* 6*d.*

MALARIA is unlike the majority of diseases, in that its epidemiology and control differ greatly in different parts of the globe. This is mainly due to the fact that there are some 30 species of *Anopheles* suspected of being carriers in one country or another; each of these has its peculiar seasons, breeding places, and habits. It follows that the control of the vector and the disease depend on knowledge of local conditions and on methods which may not be generally applicable.

Mr. MacGregor has written an account of the mosquitoes of Mauritius and Rodriguez, and has used it as the foundation of a general account of anti-mosquito measures. The result is not very successful. These islands are oceanic, with a small and specialised fauna. Much space is devoted to forest species, which breed in rot holes, and have no relation to human beings. The purpose of the book is to provide information useful to field workers who have to study the control of *Anopheles* and other mosquitoes. The more general parts of the text are clear and elementary, but parts of the book are extremely specialised, and would only be appreciated by a competent medical entomologist; we refer to some of the details relating to the anatomy of Culicine larvæ, and in particular to the reprinted Key to the Culicine Genera of the World, by Edwards. The best points of Mr. MacGregor's book are the practical notes on breeding and laboratory technique, a matter on which the author is a master, and the account of the common domestic Culicines, *Culex fatigans* and *Aëdes argenteus*, which receive insufficient treatment in most works.

Miss Evans in her description of the species of *Anopheles* found in Africa south of the Sahara gathers together the results of much previous work, done from the Liverpool School of Tropical Medicine and elsewhere. Her book will be found valuable to many field workers, whose duty it is to discover which species of *Anopheles* is harmful, where that species breeds, and how best it may be controlled. The entomological aspects of malarial control in Africa are complex, because there are more than 30 species of *Anopheles* in the continent, and because it is not yet known whether some of them are vectors of malaria or not. Miss Evans's book is admirably illustrated with line drawings and half-tones, executed by the author, and with photographs of breeding places of some of the more important species. Its value to those living out of Europe would have been increased had the work of earlier writers been abstracted more fully.

X RAY AND RADIUM IN THE TREATMENT OF DISEASES OF THE SKIN.

Second edition. By GEORGE M. MACKEE, M.D., Professor of Dermatology, New York Post-Graduate Medical School. London: Henry Kimpton. 1927. Pp. 788. 45*s.*

THE keynote to this excellent work is repeatedly emphasised in the preface—X rays and radium must be used or directed by a man who is not only a dermatologist, but also a radiologist. The author holds that "too many physicians use X ray and radium with no more knowledge of these agents than that possessed by a technician," and protests that "without a training in radiology the dermatologist cannot be resourceful in diagnosis, therapy, or research, nor can he use X rays and radium intelligently." These agents are not a panacea that can be used ignorantly and indiscriminately, and there is little doubt that the unskilful application of radiations has frequently brought the methods employed into disrepute. Dr. Mackee has planned his book on broad lines and has included in it the ground work of physics essential to the intelligent application of radiations. He is a clinician by profession and a research scholar by nature. He shows constantly that he is discontented with empirical dicta and would like to turn to laboratory experiments to investigate further the unexplained results obtained by himself and others.

The chapters dealing with protection and allied subjects are full of practical wisdom. A specially interesting chapter is that on idiosyncrasy, a subject of great importance, not only in therapeutic, but also in diagnostic work. Much information gathered from the foremost American radiologists has been compressed into this short chapter, and the author states that "the use of the term idiosyncrasy has decreased in about direct proportion to the improvement in technique and increase in therapeutic biological knowledge."

In 43 concise and orderly chapters the author discusses his own views with full regard to those held by workers who differ from him. He has succeeded in compiling a book which is not only readable but valuable to dermatologists and to all who study radiology.

INTERNAL MEDICINE.

Lehrbuch der Speziellen Pathologie und Therapie der inneren Krankheiten. By Prof. Dr. A. STRÜMPELL. Twenty-sixth edition. Revised by Prof. Dr. C. SEYFARTH, Assistant to the Medical Clinic of the University of Leipzig. Leipzig: F. C. W. Vogel. 1927. Vol. I., pp. 872; Vol. II., pp. 982. M.58 for the two vols.

A GENERATION of medical students and practitioners has been brought up on Strümpell's text-book of general medicine since it first saw the light in 1883, and now, three years after the original writer's death, the book has been brought fully up to date by Prof. Seyfarth. The first volume, which appeared in 1926, dealt with the acute infections, respiratory, circulatory, and alimentary disorders. The second volume now before us deals with diseases of the urinary and locomotor systems, of the blood, and endocrine glands, with disorders of metabolism, and concludes with a section of 500 pages on the nervous system. Three appendixes take in poisonings, prescriptions, and spas respectively. Illustrations are abundant and good although the scarcity of skiagrams is rather striking; the few that are given are printed on special plates with good effect. Treatment by physical methods receives less attention than it deserves and diathermy appears nowhere to be mentioned. But these are small drawbacks which can be rectified on the next revision, and the book remains one of the best manuals of special pathology and therapy in any language.

DISEASES OF CHILDREN.

Aids to the Diagnosis and Treatment of Diseases in Children. Sixth edition. By the late JOHN MCCAW, M.D. Revised by F. M. B. ALLEN, M.D., M.R.C.P. London: Baillière, Tindall and Cox. 1927. Pp. 330. 4*s.* 6*d.*

THE revision of this unit of the "Aids" series, written by the late Dr. McCaw, has been carried out by Dr. Frederick Allen. He has met with complete success in his attempt to keep the volume up to date, and from such important examination standpoints as ætiology, classification, and symptomatology, it should provide the student with the greater part of his necessary equipment. Dr. Allen states in the preface that he has endeavoured to increase the utility of the book by reducing the space allotted to treatment. He has done this rather too drastically, barely enough provision being made in this branch of pediatrics for examination requirements. For instance, the process of simplification has left the section on infant feeding without any definite scheme for modification of milk, the reader being referred to other text-books. With this possible exception the subject is very adequately covered, and, if used for the purpose for which it is best suited—namely, revision—this volume of the series should continue to be of great assistance to those preparing for qualifying examinations.

NUTRITION.

Feeding and the Nutritional Disorders in Infancy and Childhood. By JULIUS H. HESS, M.D., Professor of Pediatrics, Illinois University. Philadelphia: F. A. Davis Company. 1927. Pp. 566.

THIS well-known work of Prof. Hess's has been for some years representative of the most thorough-going attempts to apply the results of biochemical research to the everyday practice of pediatrics, and has made a strong appeal to those who prefer to approach the subject from the angle of pure physiology. In the new edition the author's method has scored further successes, for not only has the process of correlating theoretical considerations with practical therapy been extended in many directions, but a degree of simplification has been achieved which cannot fail to increase its popularity. In the chapter on artificial feeding Prof. Hess propounds a system in which an absolute relationship is maintained between the quantities of the food elements and the requirements of the infant per pound and kilogramme. He applies this system to the method of feeding by simple dilutions of cow's milk with added carbohydrate, and presents a scheme which is easy to apply, and free from the complicated formulæ which have rendered percentage and calorie feeding distasteful to many practitioners. One and a half ounces of milk per pound of body-weight is taken as the minimum requirement of a normal infant; a minimum addition of one-tenth of an ounce of carbohydrate per pound is made, and is supplied in the form of cane sugar up to a maximum of 1½ oz. in the day. If the carbohydrate requirement exceeds this amount it is met by the use of cereals. No fat is added to the mixture. A new chapter on cœliac disease contains a review of recent work on the ætiology and treatment, and embodies the late Prof. T. Howland's method of dieting with protein-milk as a basis. Minor additions have been made to the accounts of rickets, athrepsia, acidosis, and other disorders which involve dietetic factors.

A TEXT-BOOK OF THERAPEUTICS.

Including the Essentials of Pharmacology and Materia Medica. Seventh edition. By A. A. STEVENS, A.M., M.D., Professor of Applied Therapeutics in the University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. 1927. Pp. 758. 30*s.*

THE last decennial revision of the United States Pharmacopœia having become effective in January, 1926, the appearance of the seventh edition of this work is of some special importance in America. The book consists of two parts, the first being a description of all kinds of remedial measures, the most important of which is the long and well-tabulated section on drugs which occupies 500 pages. This section also contains references to such other forms of therapy as massage, electricity, blood transfusion, spinal puncture, and heliotherapy. The second part is a very comprehensive index of treatment.

The drugs are arranged in the usual order—that is to say, their physiological action determines their place, as in other well-known text-books such as that of Sir William Hale-White. In this edition many drugs find a place for the first time. Barium chloride in heart-block, ephedrine in asthma and hay fever, butyn in local anæsthesia, sulpharsphenamine in syphilis, and two other organic compounds containing arsenic, tryparsamide and stovarsol, are among these. The methods of administering thyroid gland are excellently described; the fresh gland is hardly mentioned, the dried extract and thyroxin in carefully adjusted doses being preferred. Insulin is fully discussed; its possible use in cases of non-diabetic acidosis is mentioned, for example, in eclampsia, post-operative acidosis, and cyclic vomiting. Insulin shock is described. Subcutaneous or intramuscular injection of Collip's extract of parathyroid is recommended in acute or chronic tetany, oral doses having been found ineffective; in other conditions—e.g., in eclampsia and paralysis agitans—the extract is useless. Potassium bismuth tartrate is recommended intramuscularly for tabetic pains and chronic syphilitic meningitis; mercuric oxycyanide as a germicidal solution in dilution of 1 : 1000; novasurol (merbaphen) as a powerful diuretic in œdema due to cardiac and renal disease; hexylresorcinol in certain cases of infection of the urinary tract, and gentian violet, brilliant green, and acriflavine as powerful antiseptics with low toxic properties. The value of scarlet fever and erysipelas antitoxins is judiciously appraised, and there is a good account of non-specific protein therapy. Transfusion of blood and heliotherapy are not dealt with in great detail.

The last part of the book consists of applied therapeutics. Accounts of general and dietetic methods of treatment will be found in their proper places, but treatment by drugs is chiefly stressed. In many sections, such as that on diseases of the respiratory

tract, useful formulæ may be found. The short section on diseases of metabolism deserves special mention, containing not only a useful diet for cases of obesity, but, much more important, a very complete analysis of the value of most foodstuffs. This analysis will help the practitioner to construct a diet in diabetes or to replace in the dietary one constituent by another.

The volume will be useful to the student of pharmacology, to the clincal clerk, and to the practitioner.

TEXT-BOOK OF BACTERIOLOGY.

By WILLIAM W. FORD, M.D., Professor of Bacteriology, School of Hygiene and Public Health, Lecturer on Hygiene, School of Medicine, Johns Hopkins University; Member State Department of Health of Maryland. London and Philadelphia: W. B. Saunders Company, Ltd. 1927. Pp. 1069. 37*s.* 6*d.*

THIS book is described as "an attempt . . . to give complete and accurate descriptions of the micro-organisms commonly encountered in medicine, comparative pathology and hygiene, and public health . . . and is intended primarily for the medical student and the medical bacteriologist." In our view its undoubted value lies not in the account of the common micro-organisms which the medical bacteriologist encounters, but in the description of the rarities which are omitted from the majority of standard text-books and can be found only after laborious search through the literature. Dr. Ford names, for example, 53 species of actinomyces, most of which are certainly not "commonly encountered"; the list may indeed appal the medical student—but perhaps Dr. Ford uses the term student in its broadest sense. It is chiefly the busy trained bacteriologist who will profit by the work, for it gives him the features of many varieties of organisms in a form easy of access. From this point of view the book is most useful. The sections on general bacteriology are somewhat inadequate; notable omissions include the whole question of "rough" variants. The brief account of technique might have been left out of an advanced text-book of this nature, as might also the picture of a microscope; the student capable of tackling 53 actinomycetes is at least acquainted with the external appearance of a microscope.

Systematic bacteriology occupies roughly three-quarters of the book, and the rest is devoted to immunity and infections of doubtful origin. Obviously it has been impossible for the author to verify more than a fraction of the work he quotes, some of the species included having been described on one occasion only, and this point must be remembered by those who use his book for reference. It is undoubtedly a valuable contribution to bacteriological literature. Those who have in the past found Macé's treatise a source of help in time of trouble will find here an up-to-date substitute for that now rather antiquated work.

TO-DAY AND TO-MORROW.

(1) *Galatea or the Future of Darwinism.* By W. RUSSELL BRAIN, M.D. Oxf. London: Kegan Paul, Trench, Trübner and Co.; New York: E. P. Dutton and Co. 1927. Pp. 95. 2*s.* 6*d.*

(2) *Archimedes or the Future of Physics.* By L. L. WHYTE. 1927. Pp. 96. Same price and publishers.

THESE two books are recent additions to the "To-day and To morrow" series which since the date of its commencement and through some 50 little books has provided us with much stimulating material, surveying modern thought in many departments of life, always with courage and often with humour.

(1) In "Galatea" Dr. Russell Brain attacks neo-Darwinian theories with closely packed arguments. He finds biology to be reaping harvests rendered available by new mechanistic methods, but points out that mechanism has been shaken to its foundation by the discovery that time and matter are "not the all-sufficient raw material of the universe but merely products of the mind's attitude towards the four dimensional world of point events"; and he here makes the apt comparison that Darwin is the Newton of biology, which still awaits an Einstein, the philosophic approach to scientific problems being as important as what is held to be the strictly scientific method. In his opening words he presents rather cruelly the course of evolution, according to neo-Darwinism, through a parable, likening mankind to a company of persons leaving London with destinations decided on at random from a time-table, and repeating this process on reaching their first destinations, it being postulated that all who were unfortunate enough to hit upon a second town, which had no station on the particular railway line as the first town, should be executed. It is a fact that this parable illustrates the criticised tenets rather happily, as giving the appearance of an orderly progress where there is no rational mode of locomotion. We recommend Galatea cordially to our readers; no résumé of its contents could be much shorter than the volume itself.

(2) "Archimedes" may well be read in juxtaposition to "Galatea," and the deductions in each may be easier to follow if the reader consults another volume in the series entitled "Gallio," in which J. W. N. Sullivan writes on the tyranny of science. Mr. Whyte's little volume is an appeal to thinkers that they should discard unjustifiable limitations in scientific thought, and should combine to discover what he believes to exist—namely, a single system of natural law which may cover the realms both of matter and life. He suggests in his book the definite line of advance for physics, pointing out that we stand at the eve of a new epoch, when physics, biology, and psychology are converging towards a scientific synthesis of unprecedented importance with results that may elucidate the problem of life—for no less than this is the outcome which he foresees of the latest inquiries into the fundamental electrical processes underlying radiation and chemical combination. As was said in respect of "Galatea," and as we have said in respect to other contributions to this brilliant series, attempts to summarise would be defeated by the author's brevity and compressed form of argument.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXIV. October–December. — In a paper entitled an Investigation on the Analysis of Human Milk, Dr. Bernard Myers reports on 184 separate analyses carried out at the Children's Clinic, Marylebone-road, of the milk of 84 nursing mothers, whose ages ranged from 16 to 30, the average age being 22. The average analysis showed protein 1·58 per cent., fat 3·85 per cent., lactose 6 per cent., and the caloric value per ounce 18·95. The last third of the milk contained the highest percentage of fat. Although a large number of analyses showed fairly similar results, there was in many instances a distinct variation, especially as regards the fat content and the protein, which within certain moderately wide limits remained normal. The milk of a nursing mother was apt to vary to some extent from day to day, but unless this variation was excessive it did not affect the infant. In conclusion Dr. Myers maintains that for the purpose of an analysis or caloric value calculation the middle third or the whole of the milk in the breast should be used.—In continuation of his paper on Insulin Treatment of Diabetes Mellitus in Children, Dr. K. U. Toverud, of Oslo, discusses the carbohydrate tolerance during insulin treatment as affected by control of the diet, the occurrence of infections, the presence of acidosis, muscular exercise, and increase in weight, and gives an account of the post-mortem examinations. The histories of the 47 cases on which the paper is based are appended, together with some striking photographs of some of the children before and after insulin treatment.

THE LANCET.

LONDON: SATURDAY, JANUARY 21, 1928.

DEATH CERTIFICATION.

IT is a common opinion that the methods of death certification might be improved, and many suggestions to that end have been made by doctors and statisticians, statisticians who are not doctors, and practitioners who, without the implications of mass figures in their minds, none the less desire to record on a State document accurate evidence. In recognition of all this, the Joint Committee on the Nomenclature of Diseases appointed by the Royal College of Physicians of London, in view of the next decennial revision of their report, has directed particular attention to the subject of death certification, and in their meetings a general feeling has been reflected that the young medical man enters into practice without fully appreciating the importance that attaches to accurate death certification. For this there seems one main reason. Of all the duties falling to the lot of the medical man there is none for which so little instruction is provided in his student days, this being apparently due to the fact that the high public significance of the responsibility has been overlooked. Can this be due to a sort of belief that the documents will always be so defective that the returns must be of little value? If this is the case it would seem that two things are overlooked in such an easy mental attitude; first, that every step ought to be taken to help the practitioner to make as accurate a return as possible so that these returns should obtain value; and secondly, that the returns as they at present exist, and with their admitted inaccuracy, are of real public service.

In the figures, as we now have them, there may be many errors, but in so far as these errors are due to carelessness and not to prejudice they cancel each other, so that correlations between disease and mortality emerge whose truth cannot be gainsaid. For example, while the statistics, as supported by death certificates in reference to alcoholism and syphilis, are regarded commonly as particularly untrustworthy, none the less these figures give a valuable picture of what is actually occurring. Employing the form of certification introduced with the International List in 1910 which is valid up to 1920, we find a fall in the alcoholic death-rate proceeding steadily, and even very rapidly in 1918 and 1919, under the influence of war conditions. In 1920 the rate rose, for the population was spending its war bonuses and feeling rich, but even so it reached but a little more than one-third of what it had been in 1910; in fact the war restrictions on the consumption of alcohol reduced this form of mortality by 81 per cent. in the four years, 1914–18, while the reaction of 1920 was reflected by a mortality-rate which attained to only about one-fifth of that before the war. Whatever, therefore, the practical value of the alcoholic death-rate may be as an accurate measure in detail of the extent of this form of mortality, it is of great value as an indication of the effect of a public movement. The accuracy of the alcoholic death-rate, it may be admitted, can be gauged from information obtained from many sources, while that from syphilis and its known sequelæ cannot be checked in this manner. We do, however, know that, while the mortality in association with venereal disease had been falling before the war, it rose rapidly during its progress, so that in 1917, when the control of venereal disease became the subject of State interference, it was at its maximum. To-day the mass figures show that the mortality-rate in syphilis and associated disease has declined from that ominous point, and they can fairly be regarded as an index of progress. If this can be said of returns which in the nature of things would always represent a maximum of unreliability, because of the many reasons for concealment, we may feel sure that under other headings of classification imposed by revised nomenclature the results can be accepted with less question. Indeed, there is no reason to doubt that mortality statistics, however imperfect, already provide preventive medicine with information of the first importance, and as medical training grows more scientific, and as medical knowledge expands in scope as well as improves in definiteness, this importance will grow. But admittedly, then, the task of filling up the actual form, imposed on the practitioner, will become more complex, and this is foreshadowed by the latest form of death certificate, where the practitioner is invited to state first the immediate cause of death and then, proceeding backwards, the morbid conditions which gave rise to this cause. Now the general rule in the office of the Registrar-General is that if several causes of death are mentioned in association on a death certificate a single cause is selected for classification, and at once a difficulty is introduced, in the ascertainment of which is the one that should be recorded. For example, a death may be certified as due to (1) heart failure, (2) myocardial degeneration, and (3) bronchitis; or as (1) bronchitis, and (2) heart disease. If it is a general rule that cardiac affections are selected for tabulation in the Registrar-General's office in preference to pulmonary affections, both these sequences of events will be allocated to heart disease. It was in order to provide a remedy for this state of affairs that the new form of certificate was framed; that is to say, it was designed to secure a definite expression in connexion with the various causes of death, so that the official tabulator might be able to follow the certifier's view of the sequence of events culminating in death. As soon as this view is clearly expressed in a large majority of certificates that reach Somerset House, the Registrar-General will no doubt feel at liberty to discard his own method of selection by rule.

It is certain that the considered views of the Joint Committee will be brought to the attention of the General Medical Council, and, as the educational authority of the medical profession, that body may hold that more assistance in regard to the matter is due to medical students at the latter end of their curriculum. The Council has done useful work for the profession and for the public in its rigid insistence on the accuracy of medical certificates of all sorts. The death certificate, more important from the public point of view than any document which requires a medical sign manual, is admittedly a delicate form to execute, and the considerations that should be before the signatory's mind might well be introduced to him before he is called upon to act professionally.

A YEAR'S EXPERIENCE OF DENTAL BENEFIT.

THE amended scheme for the administration of dental benefit under the National Insurance Acts has been in force for a little over a twelvemonth, and it is now possible to take stock of its working as it affects the dental department of a general hospital. Three categories of insured persons receive dental treatment at the hospitals—namely: (1) patients referred by the honorary medical staff of the hospital; (2) patients referred by practitioners because they require treatment which cannot be given by a private dentist; and (3) emergencies. All other insured persons are referred to outside dentists. The chief difficulty met with in applying the insurance scheme to these three categories is occasioned by the provision that an estimate of the work required should be submitted to the approved society for approval *before* treatment is begun, and by the onus placed on the patient to make a personal application to the society. In categories (1) and (2) it is often a question of extraction of one or more teeth before a course of medical treatment is started or an operation performed; delay in many cases would affect adversely the prescribed treatment. Category (3) must receive immediate attention as a matter of common humanity. The clause allowing treatment to be undertaken up to the value of 10*s.* without previous submission of an estimate does not provide effectively for the situation, as it only allows for the extraction of one tooth under nitrous oxide gas, and the treatment may only be given if the patient has already obtained a dental letter. In the case of the smaller societies whose members are in personal touch with their secretaries, such a letter can generally be had immediately, but where it has to be obtained from a large society through an agent, the delay is often considerable. The submission of estimates, moreover, entails clerical work on the part of the honorary dental staff for which they can ill spare the time, while a lay person can only furnish a statement of the work actually performed. As regards the proviso for personal application by the patient, even where the society allows the hospital to treat first and claim afterwards, it is difficult or impossible to induce patients whose pain has been eased and whose treatment is finished, to sit down and write a letter making a claim the import of which they probably do not understand.

Two of the large approved societies and several smaller ones have now recognised these difficulties and sanctioned schemes which meet the point of view of the hospital. A form is issued to the almoner at her request and the grant is made on her statement of the work done, provided she obtains the patient's signature, about which there is generally no difficulty, as most patients are willing to sign their names to help the hospital. On the other hand, three large societies still adhere to the letter of the law and refuse to make grants for dental treatment without the submission of estimates. At St. Thomas's Hospital we are informed that 91 members of one society, apparently entitled to dental benefit, were treated during the year without any recompense to the hospital. Twenty-two societies have coöperated with the hospital in giving dental treatment and have contributed £52 9*s.* 9*d.* during the year for 63 patients, an average of 16*s.* 8*d.* per patient. The total number of insured persons apparently entitled to benefit was 330, and assuming that 20 per cent. of these, on investigation, should prove not to be so entitled, payment should still have been received for about 264 instead of 63, and taking the average individual payment at 16*s.* 8*d.*, about £220 should have accrued to the hospital. Apart from these special difficulties in the application of the scheme to hospital practice, there are other objections which arise from the present lack of standardisation. In the first place, there are still a few societies which provide no dental benefit at all. The majority of them pay the whole cost of treatment according to the agreed scale issued by the British Dental Association and the Public Dental Services Association, but a few societies demand from the member a portion of the cost, generally 25 per cent. The grant for dentures is far from uniform, and although 50 per cent. of the total cost is now the rule there are still societies which reimburse the whole cost and others less than one-half. Complete suspension of benefit may occur at any moment, for the societies put aside a certain sum annually for this purpose, and if this sum is spent before the end of the year dental benefit ceases until the following year. Two of the largest societies had, in the autumn of 1927, used up the allotted funds. These variations involve real unfairness to the patients who have all paid their quota at the same rate, and engender in them a sense of soreness and bewilderment. At the same time they make the administration of dental benefit from the hospital side both difficult and unsatisfactory, and involve a vast amount of correspondence. On the other hand, the adoption of a standard dental letter is a step forward, and the more progressive societies are acting more and more on standardised lines.

A FAMOUS MEDICAL JOURNAL.

THE New Year issue of the Münchener Medizinische Wochenschrift is a Festschrift in celebration of the seventy-fifth birthday of the journal, for the first number appeared on Jan. 7th, 1854. It was from the start the property of a standing committee of Bavarian doctors, and, although modest in size, its scope was so ambitious as to incur pessimistic criticism from Rudolf Virchow who was then nothing more than an official medical officer to one of the smaller divisions of Bavaria. Like the birth of other great medical journals, the happy event had been preceded by a number of miscarriages. The Medical Correspondence Sheet founded by Dr. H. Eichhorn in 1840 survived for barely ten years, while the Medico-political Sheets of Dr. v. Jan ran for less than a year; but it was endeavours of this kind which encouraged the firm of Christian Kaiser to issue a journal which bore for 30 years the title Medical Intelligence Sheet, Organ of Bavarian State and Public Medicine, the financial success of which was ensured by the decision of the Government, two years after its foundation, to distribute it officially to all local authorities and their medical staff. This official relation lasted until 1874, when the conduct of the journal came into the hands of an independent group of medical men, headed by Otto von Bollinger, under whose influence the youthful BERNHARD SPATZ was appointed in 1885 to the editorial chair, and a year later the journal was rechristened under its present name. It was in 1890 that the business side of the paper was taken over by the present publisher, J. F. LEHMANN, in whose hands it rapidly developed from a provincial medical journal into one of worldwide importance. Financial difficulties were then a thing of the past right up to the post-war currency inflation, when the journal

lost its accumulated capital, but was just able to carry on. The military supplement was distributed gratis to all medical officers in the field from 1914 to 1917, when the paper famine made it impossible, and during the last 25 years, in spite of all these difficulties, the sum of nearly 250,000 marks has been allotted out of profits in grants towards scientific and benevolent purposes.

The first three volumes of the journal, which are now difficult to obtain, throw many interesting sidelights on contemporary medical history, some of which are dealt with fully in an introductory article by Prof. Hermann Kirschensteiner which appears at the front of the festal issue. From it we learn that 50 German medical men voluntarily took part in the Crimean War of 1855, of whom 10 died on service and only 6 returned unscathed. The early numbers bear witness to a vigilant struggle against the homœopathic influence which was then widely spread throughout the kingdom. Paris was still the favourite centre of post-graduate study for Bavarian doctors; and there is an instructive passage in a Paris letter dated 1856, giving an account of hospital pyæmia with the query: "Where is the poison? is it in the hospital air? Do the hands of the surgeons carry it? I would give my life to buy these secrets." Semmelweis had already published his early work, but it was B. Breslau who pleaded in an issue of 1854 for strict separation between the healthy and the sick puerperium, for he had seen that the mortality in childbirth which amounted to 4 per cent. in Paris and 5 per cent. in Vienna, was only 1 per cent. in Dublin with its cubicle system. The early days of the journal saw the rise of Pettenkofer to fame in connexion with the second outbreak of cholera, which killed 3000 of the 5000 persons attacked, although it seems that no Munich doctor died of it. Pettenkofer set out in the journal his subsoil theory of causation which for so long held the field. Another historic discussion concerned the infectious character of secondary syphilis, which was then generally denied. A certain Dr. Hübner had the misfortune to infect a number of vaccinated children with syphilis; he was sentenced to six months' imprisonment and discharged the service, although a number of his colleagues were prepared to assert that infection could not be conveyed in this way. These issues also contain the record of the third case of Cæsarean section, carried out by Rothmund; the child survived, but, as in both previous cases, the mother died. In these early days it is surprising to learn that the medical profession in Bavaria was already regarded as overcrowded. In the whole kingdom there was one doctor to 3784 persons; in Munich itself the proportion was 1 to 1050, and in Würzburg 1 to 619, not reckoning the professorial staff. The mortality among them was terrible. In 1855 the average age of the practising doctors was only 44·4 years; no more than 29 per cent. of the profession lived to 50 years, and 9 per cent. to 60 years. Medical practice at this time was to all intents a State service; the newly qualified man could not choose where he would settle. He was nominated to a district where there was a vacancy, and permission to practise in Munich itself was only granted after three years' rural experience—the so-called triennium rusticum. The experience of this system was not happy, especially in Nassau where it was most strict, and through the influence of Karl v. Pfeufer the State control was set aside entirely in 1865. So much for the early years. In its later history the journal contained the account of Pettenkofer's self-experiment with cholera vibrios in 1892, the Nobel prize lecture of Ehrlich in 1909 on the partial functions of cells, the most part of his early work on salvarsan, and his exposition with Gruber of the side-chain theory. Orthodiagraphy was described in the journal by Moritz in 1900, and in 1903 Albers made the first communication on the risk to the genital glands from exposure to X rays. The journal was also the first to take hypnosis seriously by the publication in 1894 of Forel's work on treatment by its means.

In another part of the festal issue, and printed in the small characters in which the Editor modestly conceals his own hand, is an interesting apologia for the advertisement part of the Munich medical journal. Many doctors, he says, have so little understanding for its value that they are actually hostile and regard this section as an unworthy bedfellow of the scientific part. The hostility, he recognises, is directed not so much to the advertisements in themselves as to the over-production of drugs. It would, however, he reminds German doctors, be thankless on their part to overlook how much they owe to the chemicopharmaceutical industry, if only for the reason that without their collaboration the size and compass of the journal would have to be considerably reduced. He takes for granted a strict censorship by the medical press of the advertisements which are accepted, and first and foremost the refusal of any influencing of the text by the advertising firms. This censorship has for long been assumed by the Editor of the Munich journal and has worked well. With these essential postulates, flourishing advertisement columns fill an important place in the framework of the journal, putting its readers in touch with information and announcements which cannot appear in the text, with new appearances in the book and instrument markets, with the latest information about baths and drugs, and providing a useful balance to devote to relief of medical suffering, to the furtherance of scientific work, to the support of medical libraries, and to supplying impecunious German doctors abroad with medical literature. Certain it is that collaboration of editor and publisher in the case of the Münchener Medizinische Wochenschrift have brought forth one of the premier medical journals of the world, and we offer Dr. SPATZ and Mr. LEHMANN our homage.

Annotations.

"Ne quid nimis."

VITAL STATISTICS FOR 1927.

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infantile mortality during the year 1927.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales ..	16·7	12·3	69
107 county boroughs and great towns including London	17·2	12·3	71
155 smaller towns ..	16·5	11·4	68
London	16·1	11·9	59

The smaller towns are those with an estimated population in 1921 of 20,000–50,000. The death-rate for England and Wales relates to the whole population, but that for London and the two groups of towns to the civil population only. Birth-rate and death-rate are per 1000 population, infant mortality-rate per 1000 births.

The Registrar-General remarks that the birth-rate is 1·1 per 1000 below that of 1926, and is the lowest rate recorded since the establishment of civil registration. The death-rate is 0·7 per 1000 above that of 1926; the excess being due to the high mortality of the first and fourth quarters of the year. The infant mortality-rate is equal to that of 1923, the lowest on record; the rate in 1926 was 70 per 1000 births. These provisional figures, which are not likely to require substantial modification, have been issued for the information of medical officers of health.

AFTER THE FLOOD.

THE conference held last Monday afternoon at the Ministry of Health to review the situation resulting from the recent flood disaster in London was attended by representatives of the London County Council, of various Government departments, and of the riparian authorities. Sir Kingsley Wood, who presided, explained that the conference had been called at the instance of the Prime Minister and its immediate duty was to settle what action should be taken to prevent a repetition of a disaster which had undoubtedly been brought about by a peculiar combination of circumstances. On behalf of the London County Council, Mr. Gatti stated that the Council's only responsibility was based on an Act of 1879, under which the Council may require owners of riverside premises to carry out flood prevention works to its satisfaction, or, in default, itself execute the works and recover the cost. The height of such works had originally been fixed by the Metropolitan Board of Works at 17 ft. 6 in. above datum-line, and this was raised to 18 ft. after the record tide of January, 1881. Since that date, 47 years ago, the tide had only once equalled and never exceeded 17 ft. 6 in.; on Dec. 26th last it reached three inches short of that figure, that is to say, the second highest point on record, without producing any signs of flooding. Existing works, he said, had now been so seriously damaged that occupation of basements in low-lying areas would be attended with danger at spring tide for some while ahead. The Council had already undertaken to institute a survey of the whole of the river defences. Speaking on behalf of the Port of London authority, Lord Ritchie said that, while normally in the course of the last hour of a flood-tide the river did not rise more than 1 ft., it actually rose 2 ft. in the last hour of the tide on the morning of the catastrophe. The desirability of raising the level of the banks required, he thought, careful consideration in view of the large expenditure involved and the improbability of the recurrence of such a tide. In any case as the work must take years to complete, it was desirable to consider whether the public could not be warned of the approach of a high tide. Any warning, to be effective, would have to originate outside the estuary of the Thames, and inquiries were on foot to see if information of the approach along the coast of a phenomenal tide could be obtained in sufficient time to give warning through the police or other authorities. Lord Desborough, on behalf of the Thames Conservancy, said that he thought the height of the tide was not greatly affected by the volume of water coming down from the upper reaches of the river. The recent disaster was due rather to the combination of a north-westerly gale with an exceptionally high flood tide. Alderman Ben Smith, M.P. for Bermondsey, pointed out that the existence of a 71 minute delay between high tide at the Isle of Dogs and at Teddington should have allowed time for warning to be given. He also remarked on the lamentable state of 600 families in Rotherhithe whose homes had been destroyed by creosote. Mr. Gatti, in reply, stated that the London County Council did not repudiate its statutory responsibility, but he contended that the adequacy of the river defences had been proved by the fact that on Boxing Day the second highest tide on record for 60 years was experienced without any signs of flooding. The conference, before adjourning, decided to set up a small subcommittee under the chairmanship of an assistant secretary of the Ministry of Health, to which the various suggestions would be referred.

SIR MACKENZIE CHALMERS.

A MEMORIAL service for Sir Mackenzie Chalmers, who died on Dec. 22nd, 1927, will be held at the Temple Church on Tuesday afternoon, Jan. 31st, at 4.45 P.M. We are reminded by this announcement of the services which, throughout an extraordinarily full official life, Sir Mackenzie rendered to the cause of medicine. He was consecutively a member of the Indian Civil Service, a Counsel to the Board of Trade, a county-court judge, a Commissioner of Assize, and a Law Member of the Viceroy's Council in India; then he was appointed, some quarter of a century ago, First Parliamentary Counsel to the Treasury, and finally, until retirement in 1908, Permanent Under Secretary of State for the Home Department. In this capacity he was a member of a Royal Commission on Vivisection, of a Departmental Committee on Coroners and Deaths under Anæsthetics, and of the Sleeping Sickness Committee, while later he served as chairman of the Committee on the Standardisation of Biological Drugs. While these had been his various responsibilities towards medicine in an official capacity, his private interest in our profession was well displayed in his chairmanship of the London Fever Hospital, in whose cause he was untiring. Medicine owes a real debt to Mackenzie Chalmers.

PROFESSIONAL SECRECY.

AN interesting report on medical confidences has just been issued in France,[1] where it appears that the accepted tradition of absolute professional secrecy has been threatened by a recent decision of the Conseil de Préfecture of Châlons-sur-Marne (May 27th, 1927). The committee which has produced the report calls upon the profession to protest vigorously against claims which would seem to demand disclosure of the diagnosis of diseases treated at patients' houses. The report insists that the legal position should remain where it stood after the decision of the Cour de Cassation in the Watelet case in 1885. No more vigorous defence of the confidential relations of doctor and patient has been made in England, but the English reader has to remember that the position in France rests not upon a professional tradition partially recognised by the law courts but upon an express enactment in the French penal code. This enactment (Article 378) is not set out in the recent report but deserves attention.

"Les médecins, chirurgiens et autres officiers de santé, ainsi que les pharmaciens, les sages femmes et toutes autres personnes dépositaires, par état ou profession, des secrets qu'on leur confie, qui, hors le cas où la loi les oblige à se porter dénonciateurs, auront révélé ces secrets, seront punis d'un emprisonnement d'un mois à six mois et d'une amende de cent francs à cinq cents francs."

It would appear to follow that secrecy must be maintained even after the patient's death, whereas in English practice death is regarded as lessening the duty of secrecy. Under English law, indeed, the patient's remedy in this respect (for breach of professional secrecy) dies with him. It is noteworthy that the French committee's report contains objections even to the disclosure of information regarding the cause of death. Such violation of secrecy, it points out, has grave inconveniences; the doctor, wishing to protect the dead patient's memory, inclines towards a misleading diagnosis—cerebral hæmorrhage, for instance, instead of cerebral syphilis, or (where disclosure of diagnosis would amount to actually charging a party with a crime) peritonitis instead of abortion.

In England, where the absence of an all-embracing codification of the law has left so many matters a little indefinite, the position could not be put so high as in France where the profession can insist on the logical consequences of Article 378. When the Duchess of Kingston was charged with bigamy in 1776 and Cæsar Hawkins made the traditional protest against being required in his evidence to reveal something of which he had become aware in his professional capacity, Lord Mansfield summed up the position quite clearly. "If a surgeon was voluntarily to reveal these secrets, to be sure he would be guilty of a breach of honour and of great indiscretion;

[1] Bull. de l'Acad. de Méd., 1928, xcviii., 650.

but to give that information in a court of justice which by the law of the land he is bound to do will never be imputed to him as any indiscretion whatever." Mansfield was stating the law in the peculiar atmosphere of the criminal trial of a peer of the realm; the legal position was explained more fully and more recently in 1881 by Jessel, M.R., in Wheeler *v.* le Marchant, where the absolute privilege of the lawyer was contrasted with the limited privilege of the priest or the doctor. "It must not be supposed that there is any principle which says that every confidential communication which it is necessary to make in order to carry on the ordinary business of life is protected; the protection is of a very limited character and in this country is restricted to the obtaining of the assistance of lawyers as regards the conduct of litigation or the rights to property." It is this anomalous distinction between legal and medical privilege which surprises the English public and which will probably lead to some amendment of the law. The contradictory directions given by the State in the case of venereal disease clinics has naturally focused attention on the doctor's dilemma. "Keep absolute silence," say the Regulations of the Ministry of Health. "Tell us all you know," say the law courts. This is a contradiction which no departmental exposition can mitigate. In France, it seems, it is the department which is insisting upon the breach of secrecy.

ATROPHY FROM DISUSE.

ATROPHY of voluntary muscle from disuse has been generally accepted as a pathological fact for many years, and such disuse has by some been supposed to account fully for the wasting of muscles cut off from their central nervous centres, as well as for that of the muscles connected with ankylosed joints, and for wasting after fracture or prolonged immobilisation for any reason. But this view of the pathology of atrophy is not universally held, and those who rejected it have always been able to point to certain facts that cannot be accounted for in that way. The marked and permanent atrophy of the quadriceps, which follows on fractured patella, no matter how complete the anatomical restoration may be, offers a case in point. Again the muscular atrophy in bone or joint disease is much more rapid than that which follows on prolonged immobilisation for the correction of deformity and such-like. This wasting is not prevented by electrically stimulated contractions. Such atrophy is more extensive and lasting in adults than in children. All these and other considerations are set forth by Mr. N. Ross-Smith, surgical registrar to the Royal National Orthopædic Hospital, in a paper [1] in which he adduces the evidence afforded by the condition of a muscle which can never have done any work at all. Such is the so-called peroneus, more accurately named tibio-fibularis, which Mr. Ross-Smith has dissected and examined in two cases of congenital absence of the tibia and which Sir Arthur Keith has described in a case of Mr. R. Ollerenshaw's. As this muscle in all three cases had no insertion it was incapable of doing any work at all and was in a condition of more complete disuse than any normal muscle could be. Yet macroscopically and microscopically it was found to consist of normal healthy fibres and showed not the slightest sign of degeneration. In life the muscle had not been known to shorten. As the ages of the three patients ranged from 2 to 15 years there had been ample time for atrophy to show itself. The illustrations of Mr. Ross-Smith's paper show very clearly the histological and naked-eye appearances of the parts concerned. Despite experiments and investigations made in recent years, there is still evidently a good deal to be learnt as to the nutrition of muscle and much more extensive research will be necessary before we can hope to have a complete knowledge of the subject, to obtain which the very significant conditions found in congenital deformities will have to be taken into account. When we know all the factors concerned in the atrophy and restoration of disused muscles and the ways in which these factors exert their influence we may hope to be on the way to understanding the pathology of Volkmann's ischæmic paralysis to an extent that is beyond us at present. Such knowledge will probably prevent those catastrophes which are disastrous to the patient and most disconcerting to the surgeon, who is lucky if he escape an action at law and the payment of heavy damages as was demonstrated quite recently.[2]

[1] Jour. of Anat., lxii., 238.

CRYSTALLISED TUBERCULIN.

DURING the last 18 months a whole series of reports on the active principle of tuberculin have been published by Dr. Esmond R. Long and Dr. Florence B. Seibert [3] from the Sprague Memorial Institute and the Department of Pathology of the University of Chicago. Through coöperation with other organisations these workers have been able to avail themselves of enormous quantites of tuberculin—literally many gallons. The starting-point of the research was the growth of the tubercle bacillus on a protein-free fluid medium from which the bacillus was able to elaborate protein. The advantage of tuberculin produced in this way is that substances produced in the medium by the growth of the bacillus can be readily separated since all the constituents of the medium before growth are already known. Having obtained an almost unlimited supply of tuberculin in this way the authors proceeded to investigate the product by methods of dialysis, adsorption, enzymic action, and protein precipitation. Briefly recorded, the results of these investigations are as follows. The active principle of untreated tuberculin would appear to be a colloidal substance which does not pass through animal and vegetable membranes. This colloid gives all the usual protein tests and can be precipitated by acids at its isoelectric point, pH 4·0. Saturation with ammonium sulphate precipitates all detectable protein, this precipitate possessing the typical toxic properties of tuberculin. Proteolytic enzymes lessen or destroy the activity of this tuberculin in proportion to their power of splitting up the protein molecule; hydrolysis by hydrochloric acid also destroys activity in the same way. The next step was to obtain the protein constituent of tuberculin in a pure state. After extensive experiment Dr. Seibert [4] has succeeded in recrystallising the protein portion as many as 14 times, and has shown that this product, which is crystallisable into needles and burrs and is labile and unstable in water, has a greater potency than the original.

[2] THE LANCET, 1927, ii., 1318.
[3] Amer. Rev. of Tub., 1926, xiii., 393; and Tubercle, 1926, viii., 111.
[4] Jour. Amer. Med. Assoc., Dec. 3rd, 1927 (editorial).
[5] Canad. Med. Assoc. Jour., 1927, xvii., 1186.

TYPHOID FEVER IN CHILDREN.

SINCE no epidemic of typhoid fever of any magnitude has occurred in any large town in this country during the present century, it seems to follow that much of what is written of the disease in modern text-books of pædiatrics cannot be based upon personal observations. Hence the value of a paper [5] by Dr. Saul J. Usher in which he describes 116 cases of typhoid fever in children under his personal observation in the Montreal epidemic of 1927, and 59 others to whose records he had access. The epidemic was transmitted by milk, which no doubt accounts for the large number of children under the age of 5 years who were affected. The onset was fairly rapid with fever, headache, loss of appetite, and general malaise as the most prominent symptoms. Gastro-intestinal symptoms were rare at the onset, epistaxis occurred in 17 per cent., mostly older children, while convulsions were noted only in one instance, an infant of 9 months. With the disease established the average temperature was 101°–103° F. in the majority of cases, while the pulse-rate varied between 90 and 120. Constipation was

present in most patients; vomiting and loss of appetite were quite infrequent. Nervous symptoms were often noted during the course of the disease; in the younger children taking the form of restlessness, irritability, and fretfulness; in the older children of dullness, apathy, or listlessness. Delirium occurred during the height of the fever and rarely needed special treatment. In most cases the rash was scanty, seen chiefly over the abdomen and lower back; splenic enlargement was appreciable to the finger in 138 out of the total 175 cases. To turn to the laboratory findings: a positive Widal reaction was obtained in 91 per cent. of cases, and of these 59 per cent. were positive in the first ten days of the illness. Blood culture taken in 71 cases proved positive for the typhoid bacillus in 50 and completely negative in the remainder; in no case was paratyphoid A or B found. The cholesterol content of the whole blood was estimated in 15 acute and in 13 convalescent cases; in each case the cholesterol was found to be definitely increased, more so in the acute, and its fall to normal was very gradual after recovery. Complications were numerous and included suppurative processes such as otitis media and furunculosis. Intestinal hæmorrhage occurred in five cases, and perforation in four; ulcerative laryngitis in two cases. Only three patients relapsed and 12 died, a total mortality-rate of 6·8 per cent. For treatment, hydrotherapy was systematically employed, sponging being preferred. Diarrhœa never needed interference and constipation was dealt with by liquid paraffin. The original paper will repay study.

THE USES OF EPHEDRINE.

SINCE the rediscovery of the alkaloid ephedrine from the plant *Ephedra vulgaris* by K. K. Chen in 1923 there has been gradually accumulating a large volume of literature dealing with its use and effects in the treatment of asthma.[1] T. L. Althausen and I. C. Schumacher in a recent paper [2] report the use of this drug in a number of morbid conditions and summarise their personal experience with it in the treatment of bronchial asthma and hay fever. They point out that for 5000 years decoctions of the plant have been used in China as a diaphoretic and antipyretic, and at the time of the original discovery of the alkaloid, by K. Nagai in 1887, investigators were mostly concerned with its mydriatric properties. The present authors used it in nine cases of chronic vascular hypotension, giving it by the mouth in doses of 50 mg. three times a day. In all cases a rise of systolic blood pressure varying from 9 to 46 mm. was obtained in five minutes to an hour after administration and the pressure remained up for four hours or more. As far as subjective symptoms were concerned, three patients only felt stronger while the remainder noticed no change. In the acute fall of blood pressure encountered in conditions of shock or after severe hæmorrhage ephedrine might be expected to be of considerable use, but the authors conclude that its beneficial effects are doubtful and that favourable results are only to be expected if it is given early or as a prophylactic. They quote certain opinions to the effect that ephedrine may be definitely harmful to the heart under such circumstances. With regard to the use of the drug in other conditions, a dramatic result was obtained in one case of toxic erythema five minutes after 65 mg. of the drug had been taken by the mouth. In seven cases of urticaria ephedrine was tried, but only doubtful benefit was obtained in two of them, while three patients with angioneurotic œdema failed to react favourably after administration of the drug. More consistent results were observed from the use of ephedrine of asthma in a series of 39 cases. Complete relief was obtained in 56 per cent. and in a further 24 per cent. partial relief. In order to eliminate a purely psychical effect the authors estimated the vital capacity and blood pressure before and after treatment. In one patient, 15 minutes after taking the drug, vital capacity was increased from 20 per cent. of the normal to 33 per cent. and the systolic blood pressure had risen by 20 mm. These objective results corresponded with a marked subjective improvement leading to complete relief from the attack. It is found that undesirable effects, such as nausea and vomiting, are especially likely to occur if adrenalin has previously been employed: some tolerance to the use of the drug was observed in 15 per cent. of cases. With regard to the possibilities of harm from the repeated administration, it is suggested that more observations on the question of renal irritation would be of value since red blood cells and casts were found in the urine of several patients after only a short course of the drug. Observations of this sort are welcome in determining to what extent the therapeutic value of this promising alkaloid is limited by toxic effects.

[1] See also THE LANCET, 1927, ii., 669.
[2] Arch. Int. Med., 1927, xl., 851.

THE PREVENTION OF PERITONEAL ADHESIONS.

Dr. J. R. Buchbinder,[1] of Chicago, has lately published some experiments upon the prevention of the formation of peritoneal adhesions. His object seems to have been to discover some method by which a tube inserted into the peritoneal cavity could be made to act as a drain for a considerable period. He has succeeded in so far as he has proved that, in normal animals, a serous transudate can be provoked by the intraperitoneal injection of hypertonic dextrose solution, and that if this effusion is voluminous enough fibrin-formation, and so the encapsulation of a rubber drainage-tube, is prevented. In such a way a profuse discharge may be made to exude from a drainage-tube for several days. Further, he has shown that this statement holds good if a chemical or mechanical irritation of the serous coat of the intestine is produced at the time when the tube is inserted. Attention is directed to this experimental work because it illustrates how difficult it is for a research worker to resist the temptation to introduce a modification in the treatment of disease upon the very insufficient grounds of the results of experiments which may not have any relevance at all to the problem concerned. Dr. Buchbinder says "the method opens up possibilities in the prolonged drainage of the peritoneum in cases of diffuse peritonitis." By this he tacitly assumes that the average surgeon would desire to see a profuse flow of serous fluid emerge from his abdominal drainage-tubes inserted for peritonitis, at the expense of the fibrin-forming and thereby infection-localising power of the peritoneum. It is axiomatic that in any infected wound an outward serous flow is desirable and all successful methods of treating acute infections are hyperæmia-producing, lymph flow-promoting procedures. Fomentations, radiant heat, hypertonic salt, the mere opening of an abscess or the incision of a cellulitic area, all have for their object the increase of the flow of lymph or its revived circulation where perhaps stasis already exists. Yet such increased exudation of fluid can be bought too dearly, and in the case of the peritoneum it would seem unwise to adopt, without a much fuller investigation, a method which interferes with that wonderful localising reaction which can only take place if fibrin is allowed to form and glue adjacent viscera to one another in the production of a defensive barrier to the extension of the infection. Moreover, however desirable such profuse flow of serous fluid is, it must ever be remembered that peritonitis is more often than not caused by streptococci, organisms which flourish in the lymph, the serophytes of Sir Almroth Wright. Such organisms can be fought only by the leucocytes which of necessity must have access to them. Tissue culture experiments have shown that the migration of cells cannot take place in a fluid medium alone. Some support is necessary for their movement. This is provided in the body by the network of coagulated lymph which covers the surface of raw or inflamed

[1] Surgery, Gynecology, and Obstetrics, 1927, xlv., 769.

viscera. In the scaffolding of fibrin leucocytes can move; they can reach the infecting organisms which they alone are able to attack. So important is this cellular defence against infection that the use of any agent which directly limits or interferes with fibrin-formation in the infected peritoneum is strongly to be deprecated. Drainage for diffuse peritonitis is always necessary, but the surgeon in instituting it hopes thereby to bring about localisation of the process. He is not likely to do this by interfering with the production of fibrin. The problem of peritoneal adhesions is not the prevention of their formation during an acute infective process, but the elucidation of the cause of their formation, and especially the failure of their resolution in some abdominal affections which have never been acute, and, at any rate at their inception, may not even have been infections at all.

A PORTABLE BASAL METABOLISM APPARATUS.

ESTIMATIONS of basal metabolism may prove of value in determining the relative vital activities of groups of individuals of different races. It has recently been shown that the metabolism of healthy Japanese, Chinese, and American women students living under the same conditions in the same college showed a racial difference, the metabolism of the Japanese and Chinese being perceptibly lower than that of the Americans. Confirmation of this fact has led anthropologists during the past year to develop a project for studying the metabolism of various races in different parts of the world. A stumbling block to such a project, however, is the complicated nature of the apparatus for estimating basal metabolism and its unsuitability for use in regions remote from laboratories. In a recent paper[1] Dr. F. G. Benedict describes his modification of the student respiration apparatus, designed by Benedict and Benedict in 1923, to meet these fresh requirements. The principle of what he calls a "field respiration apparatus" is the introduction of a measured amount of pure oxygen into a closed circuit and the estimation of the time taken for its absorption. This method does away with gas analysis and the need for a gasometer, while it gives an accurate record of the oxygen consumed. The technique is briefly this: the subject breathes through a rubber mouth-piece into a circuit containing oxygen-rich air. This closed circuit consists of a metal can, partly filled with soda lime, to absorb the carbon dioxide given out, and covered with a light rubber bathing cap for the expansion and contraction of air during respiration. The oxygen consumed is replaced from a rubber bag by oxygen saturated with water vapour and delivered in measured quantities into the circuit by a pump of known and constant volume. The experiment begins and ends with the bathing cap at a definite degree of distension, indicated by an index button on the tip of the cap in contact with a fixed point, the oxygen introduced during the experiment being thus equal in amount to the oxygen consumed by the subject. The only major measurement needed for the calculation of the basal metabolism with this apparatus is the time required for the absorption of six pumpfuls of oxygen, normally about ten minutes. Dr. Benedict describes the various parts of the apparatus and the technique of an experiment in detail, and sets out possible sources of error and the means of obviating them. The apparatus, he says, is already being used in Hong-Kong, Jamaica, Peru, Mexico, New Guinea, and South Australia. Those who have used a simple apparatus of this type for estimating basal metabolism cannot fail to be impressed by the ease and simplicity of the process compared with the complicated type in which the analysis of a sample of expired air, followed by calculation, is a prelude to the measurement of the oxygen absorbed.

[1] A field respiration apparatus for a medical and physiological survey of racial metabolism, Boston Medical and Surgical Journal, Dec. 22nd, 1927.

A TUBERCULOSIS SURVEY AMONG SCHOOL-CHILDREN.

IN the *Journal* of the Norwegian National Association against Tuberculosis for December, 1927, is an account by Prof. Th. Froelich of a tuberculosis survey of school-children started by him in 1912. He wanted to know how many children were already infected by tuberculosis in Oslo at the age of 7, when school begins. To work with as uniform a material as possible he selected the children who had been born between September, 1904, and September, 1905, examining clinically and with the Pirquet test 2900, or 66 per cent., of all the children in Oslo aged 7 years. With the help of the public health authorities his findings were correlated with the notifications of tuberculosis in the town, so that fairly accurate information was available as to the degree of exposure to infection to which each child was subjected. The visiting tuberculosis nurses of the public health service made inquiries at the homes of all the children, and were thus able to follow up the careers till the age of 20 of all except those who left the town before this age. Much of the information obtained in this way is of considerable interest and should help to stimulate the organisation of similar surveys elsewhere. It was found that 84 per cent. of the children were already Pirquet-positive, and that between 4 and 5 per cent. already showed clinical signs of tuberculosis. In 4·8 per cent. there were infectious cases of tuberculosis in the homes. At the end of 1925 75 per cent. of all the children were traced, and of the 1830 children found in 1912 to be Pirquet-positive, as many as 223 (or 12·2 per cent.) had subsequently developed tuberculosis, and 79 had died of it. The deaths from tuberculosis were twice as frequent among the girls as among the boys; for every 1000 boys who were Pirquet-positive at the age of 7 20 died of tuberculosis before the age of 20, whereas for every 1000 girls in the same category there were 39 deaths. The fate of the 332 children who were Pirquet-negative at the age of 7 depended largely on their sex. When the boys and girls were taken together the subsequent incidence of tuberculosis among them was somewhat lower than that among the boys and girls who had been Pirquet-positive at the age of 7. But when the originally Pirquet-negative children were classified according to sex it was found that the subsequent death-rate from tuberculosis among the girls was as high as 5·4 per cent., whereas it was only 0·6 per cent. among the boys. The tuberculosis death-rate among the girls who had been Pirquet-positive at the age of 7 was 3·9 per cent. As was to be expected the tuberculosis incidence was considerably higher among the children in whose homes there were open cases of tuberculosis than in homes free from tuberculosis.

CANCER OF THE UTERUS.

A RECENT report by the Ministry of Health's Departmental Committee on Cancer[1] analysed some 80,000 cases of cancer of the uterus reported from all over the world. Most of them were foreign, and owing to the apparent disinclination of English surgeons in general to publish their results it has been difficult to decide whether the conclusions were applicable to practice in this country. In order to settle this question the Committee has taken advantage of an investigation which Mr. W. McK. H. McCullagh was making at the Samaritan Free Hospital, where high-grade treatment has been given by a number of different surgeons over a suitable period. The facts elicited are described in a further report,[2] and it is satisfactory to find that in nearly 900 cases treated between 1901 and 1920 the results were as good as, or better than, the average deduced from reported cases at home and abroad. The percentage of patients whose

[1] Ministry of Health Report on Public Health and Medical Subjects, No. 40.
[2] Ibid., No. 47. H.M. Stationery Office. 9*d*.

condition was deemed operable was much the same as the average, being 52·8 for cancer of the cervix and 78·8 for cancer of the body of the uterus. The operative mortality for the former condition was, however, only 8·6 as against 17·3, and though for cancer of the body it was higher (11·9) the sample was a small one. Of patients who had abdominal hysterectomy for cancer of the cervix 43·8 per cent. were alive after five years, and 36·6 per cent. after ten. For cancer of the body the percentage of survivors after five years was 61·5. These results, it is pointed out, might be greatly improved, and in cervical cases the successes could probably be almost doubled, if patients would attend for treatment in the early stage of the disease. In the Samaritan Free Hospital series the mean alleged duration of the symptoms was about six months in cases considered still operable; and by this time nearly 50 per cent. of cases are beyond surgical treatment. The time elapsing before patients applied on account of symptoms of cancer of the body of the uterus was found on the average to be about 18 months. Among other conclusions drawn from this report is that in cancer of the cervix younger women are under no disadvantage as regards prognosis, whilst consideration is also devoted to the possible association of cancer of the uterus with miscarriages. "There can be little doubt," it is stated, "of the closer association of miscarriages with cancer of the uterus" than with cancer of the breast, and the suggestion is made that this association should be further studied. As was mentioned in our summary [3] of a circular issued by the Ministry a fortnight ago, it is not the number of children born, but the fact of a birth having taken place, that is of importance in the ætiology of cervical cancer.

The present report, which is the work of Dr. Janet Lane-Claypon and Mr. McCullagh, is a useful appendix to those previously issued. It contains no evidence bearing on the value of radiological treatment, as this was hardly used at the hospital during the time covered by the inquiry.

SOMATIC CHANGES IN MENTAL DISEASE.

THERE are some enthusiasts who tackle light-heartedly the problem of research into somatic conditions in the hope of quickly solving the riddle of the interaction of mind and body and discovering the cause of insanity in bodily changes. How complex are such changes, and how obscure their relation, whether of cause or of effect, to the mental states in psychoses, is well seen in the results of a careful piece of research conducted in Swedish mental hospitals by Dr. Torsten Sonden.[4] The author set out to investigate the supposed correlation between changes in mental state and certain somatic conditions by means of frequently repeated estimations made over long periods in cases of manic-depressive insanity. In each section he gives a full discussion of previous work, exact details of his technique, and experimental and statistical errors; tables and charts are supplied with the values obtained, while a very full account is given of the 11 cases finally selected as suitable for investigation, including diary notes of their mental states throughout the period. It is evident that Dr. Sonden is a worker whose results have been subjected to the strictest controls. He contends that too much research has been directed to the collection of a few results from each of large—and often diverse—groups of cases, and that the more fruitful line of work is that which he has followed, an intensive examination of the range of individual variations in strictly selected small groups; four of his cases were under investigation for 2½ years, and the rest at least for many months covering different phases of mental state. His general conclusion is that some parallelism between mental and bodily states is shown, but only in certain cases; his results give no evidence of any somatic condition which can be considered to cause the mental disorder or throw any light on its causation. He discusses fully the literature on the subject and the theories which have been put forward, and shows that no conclusive evidence exists as to the action of supposed endocrine and autonomic causative factors in the manic-depressive psychosis. The somatic conditions in which he finds some parallelism with the mental state are temperature and pulse-rate, which are often slightly raised in manic periods, and blood pressure, which is raised in manic and melancholic phases alike. Respiratory-rate does not show similar changes. The erythrocyte count, done at two-day intervals, rose regularly in some, but not all, cases, at the transition from normality to either mania or depression, and since the serum albumin shows a coincident rise he suggests that the change is due either to an alteration in the fluid quantity of the blood, or, more probably, a redistribution of fluid between blood and tissues. This probability is increased by the great variability of daily leucocyte counts; these tend to be greater during manic periods, especially neutrophils, but so many factors influence such counts that the figures obtained show no clear evidence as to the connexion of these variations with the mental state. Estimations of blood-sugar, non-protein nitrogen, hæmoglobin, urea-nitrogen, and creatinine show no definite parallelism, and the experiments on the effect of adrenalin on blood pressure and on the oculo-cardiac reflex and Loewi's reaction give no definite evidence of any special changes of vegetative tonus accompanying the changes of mental phase.

[3] THE LANCET, Jan. 7th, p. 46.

[4] A Study of Somatic Conditions in Manic-Depressive Psychosis. Upsala Läkareförenings Förhandlingar. New series. Vol. xxxiii. Parts 1 and 2. 10 kroner.

THE death is announced of Dr. Alexander Hodgkinson on Jan. 11th at his home at Farnham, Surrey. Dr. Hodgkinson was largely instrumental in founding the Hospital for Consumption and Diseases of the Throat at Manchester, and for many years served on its honorary staff as physician.

THE bicentenary of the birth of John Hunter will be celebrated by the Royal College of Surgeons of England on Feb. 14th. At 4 P.M. Sir Holburt Waring will deliver the Hunterian oration, and at 8 P.M. there will be a dinner at the College. On Feb. 16th a reception is to be held from 3 P.M. onwards at the College, and at 5 P.M. Dr. G. C. Peachey will deliver the Thomas Vicary lecture, his subject being the Homes of Hunter.

THE next Congress of the Royal Institute of Public Health is to be held in Dublin from August 15th to 20th, at the invitation of the Government of the Irish Free State. The Minister for Local Government and Public Health has accepted the presidency of the Congress, and a list of vice-presidents has been drawn up. It is intended to distribute the work among four sections: (1) State Medicine, dealing with four groups—namely, (*a*) epidemiology, (*b*) municipal, county, and port sanitary work, (*c*) tuberculosis, and (*d*) housing and town planning. (2) Bacteriology, pathology, and biochemistry. (3) Maternity and child welfare and school medical inspection. (4) Production and control of food and milk. The arrangements in Dublin are in the hands of a representative committee, the honorary secretaries being Mr. G. Sherlock (town clerk), Mr. M. Russell (medical officer of health), and Sir William Thompson.

INDEX TO "THE LANCET," VOL. II., 1927.

THE Index and Title-page to Vol. II., 1927, which was completed with the issue of Dec. 31st, is now in preparation. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLIX.

THE TREATMENT OF MINOR DEGREES OF NASAL OBSTRUCTION.

I.* Deflections of the Septum and Abnormalities of the Turbinate Bones.

Since the advent of the operation of submucous resection of the nasal septum there is little doubt that the operation has been much abused, and has been frequently performed when it is quite unnecessary. It must be remembered that a certain amount of septal deviation is the rule rather than the exception amongst the Anglo-Saxon and Hebraic races; it is important then that the practitioner should have some definite guidance as to the question of operation.

The importance of the rôle of infected tonsils and adenoids in the causation of nasal obstruction, especially when associated, as is so often the case, with varying degrees of septal deflection, must be emphasised. Experience in hospital out-patient work has repeatedly shown that the eradication of these septic foci has obviated the necessity for septal operations in many patients sent up as candidates for submucous resection.

Indications for Submucous Resection.

Submucous resection is in present-day surgery almost invariably the operation of choice. Certain cases of *nasal obstruction with marked deflection* obviously require operative interference. Naturally the risk of a subsequent traumatic perforation is great, but provided such perforation be not too far forward the inconvenience is slight, and the perforation may in itself improve the airway. Marked external deformity is, of course, a justifiable indication for operation. In certain cases of *chronic middle-ear catarrh* the straightening of the airway may improve the aeration of the middle ear via the Eustachian tube, or may permit of the introduction of the catheter for purposes of inflation. In deafness due to other causes submucous resection is in my opinion but seldom productive of improvement. An appreciable number of cases of *persistent frontal headache and supra-orbital neuralgia* are due to deviations of the upper part of the septum. The symptoms are probably caused by interference with the ventilation of the fronto-ethmoidal cells, and the straightening of the septum has most satisfactory results. In cases of *hay fever or asthma* where the presence of a septal deviation is aggravating the condition; also in *epistaxis* where the bleeding comes from the summit of the convexity or is due to the collection of dust in the pocket of a deep concavity. Resection of the septum may give most beneficial results in cases of *unilateral atrophic rhinitis* occurring on the roomy side of a nose. Lastly, the operation may be required as a preliminary to the efficient treatment of *nasal polypi*, or of suppuration in the accessory sinuses.

It must not be forgotten, however, that in many cases of nasal obstruction a deflected septum may be merely an accessory after the fact, the real criminal being a chronic rhinitis or a diseased sinus. Here it is obvious that the septum is not to be sentenced until the other offenders have been dealt with.

Collapse of the Alæ Nasi.

Collapse of the alæ nasi is not infrequently the cause of nasal obstruction. Such collapse is almost always associated with the presence of adenoids or of a septal deflection, and the practitioner may well overlook the alar deformity in the presence of the other abnormalities. He is then apt to be disappointed when the symptoms do not disappear after the removal of the adenoids or the anatomically successful straightening of the septum. In the adult, of course, the alar collapse may persist long after the causative adenoids have undergone their customary shrinkage. It is often possible to relieve the condition by means of suitable breathing exercises, thus developing the atrophied dilators of the alæ. The patient should be shown the appropriate movements, and should practise them systematically three or four times daily. At the outset the practice should take place in front of a mirror until the muscles are well under control. If obstruction persist despite the exercises the use of Francis's nasal props may give much relief—these cause but little distress either physically or cosmetically.

Enlargement of the Turbinate Bones.

The other great cause of nasal obstruction to be considered is the enlargement of the turbinate bones. Such enlargement occurs in three stages: (1) Slight general thickening of the mucous membrane. (2) Turgescence. (3) True hypertrophy. These are the pathological changes found in patients suffering from what is popularly designated catarrh.

The first stage is liable to be a sequela of the acute rhinitis associated with the specific fevers, but may also be due to occupational conditions—for example, in stonemasons or tobacco workers, or to injudicious dietetic habits or insufficiency of outdoor exercise. Treatment then consists in the use of the nasal douche—I prefer the use of an all-rubber nasal bulb to the "sniffing" method as less likely to cause headache—or in regulation of the occupation, diet, or exercise of the patient.

Turgescence and true hypertrophy are prone to cause the practitioner to make errors of diagnosis; fully 50 per cent. of the patients sent to out-patient departments labelled "polypi" are in fact suffering from turbinal enlargement. Great disappointment and a certain amount of loss of faith are evinced when no polypus is forthcoming. The naked-eye appearances are admittedly often very similar, and the practitioner would do well to remember that without the use of cocaine and the nasal probe the differential diagnosis may be extremely difficult.

In the turgescent stage the application of cocaine and adrenalin will cause almost complete collapse of the swelling, and it is in such cases that the use of the galvano-cautery is extremely beneficial. It is generally advised that a deep line be made with the cautery point to cause a subsequent fibrosis, but experience shows that relief is often obtained by a light superficial application, which probably has a beneficial action on the vasomotor mechanism. A point to bear in mind is that a very pale and excessive turgescence is found in those addicted to snuff-taking, a practice which is more common than is usually suspected amongst shop assistants, who are debarred from the use of tobacco during working hours. The tumefaction may involve both the anterior and posterior ends of the bone, and in advanced cases partial turbinectomy of one or both ends may be required.

In the third stage there is true hyperplasia, and even after the application of cocaine, which will relieve any coexisting turgescence, the turbinal remains definitely enlarged. Either the middle or the inferior turbinals may be affected, and the treatment will be considered separately.

Hyperplasia of the Middle Turbinal.

In my opinion the cautery should not be applied to the diseased middle turbinal; unpleasant and even dangerous results have followed its use. The main pathological changes are: (*a*) Enlargement of the anterior end. (*b*) Cystic enlargement of the head of the bone. It is well to remember that the pressure of the enlarged turbinal on the septum or its interference with the aeration of the fronto-ethmoidal cells may cause persistent neuralgia across the bridge of the nose or in the infra- or supra-orbital regions.

* Part II., entitled Nasal Polypi and Ethmoidal Disease, will appear next week.

Anosmia and aprosexia are also fairly common symptoms. The best treatment consists in the removal of the enlarged end by the nasal snare, a proceeding which is facilitated if a deep incision behind the enlarged portion be previously made with a punch forceps such as Grunwald's. The same procedure may be used to remove cysts, but if these are friable their complete removal by the snare is often impossible, and a "mopping-up" operation with curette or forceps may be required. Glegg's nasal snare is the best. It has the following advantages: (1) The wire can be easily and rapidly threaded or unthreaded. (2) The size of the loop can be regulated *after* threading. (3) Should more than one application be necessary the loop can be pushed out without twisting.

Hyperplasia of the Inferior Turbinal.

The treatment of the hyperplastic inferior turbinal is also operative, but one must be most conservative as to the amount removed, since marked dryness or even a pseudo-atrophic rhinitis may follow the sacrifice of too great a portion. Removal of the anterior end by the snare will be facilitated if an incision with angular scissors be first made along the attachment of the turbinal to the outer nasal wall, otherwise the snare is apt to slip.

For the removal of the enlarged posterior ends a general anæsthetic is usually advisable, when a finger may be passed into the post-nasal space to guide the loop of the snare into the desired position. The other operations mentioned may be performed under local anæsthesia.

After-treatment.

My usual practice is to instil hydrogen peroxide drops t.d.s. for some three or four days, followed by the use of the nasal wash twice daily until healing is complete. The use of neb. menthol is often soothing and beneficial.

PHILIP JORY, F.R.C.S. Eng.,
Surgeon, Ear, Nose and Throat Department, St. George's Hospital and East London Hospital for Children; Surgeon-Laryngologist, Mount Vernon Hospital.

Special Articles.

ESTIMATION OF VITAMIN A IN COD-LIVER OIL.

REPORT* ON A COMPARISON BETWEEN THE COLORIMETRIC (ROSENHEIM, DRUMMOND) AND THE BIOLOGICAL METHOD OF DETERMINING VITAMIN A IN COD-LIVER OIL.

THE work summarised in this report was organised by the Accessory Food Factors Committee at the request of Dr. H. H. Dale, Chairman of the Second International Conference (League of Nations) on the Biological Standardisation of Certain Remedies, Geneva, August–September, 1925. A subcommittee of this Conference (Dr. H. H. Dale, England; Prof. Poulsson, Norway; Prof. Voegtlin, United States) had been appointed to arrange for a special test to be made of the validity of the colorimetric method for estimation of vitamin A described by Rosenheim and Drummond [1] in comparison with the biological method.

For the purposes of this test seven samples of cod-liver oil were provided, six by Prof. Poulsson and one by Dr. Dale.

Dr. O. Rosenheim, F.R.S., consented to determine the vitamin A content of these oils by the colorimetric test, and the following four laboratories were invited to make independent tests of the same oils, using the biological method: Department of Biochemistry, University College, Prof. J. C. Drummond; Department of Pharmacology, University of Sheffield, Prof. E. Mellanby, F.R.S.; Department of Physiology, King's College for Women, Prof. V. H. Mottram; Department of Experimental Pathology, Lister Institute, Prof. Sir Charles Martin, F.R.S.

Colorimetric Test for Vitamin A Assay in Cod-liver Oils.

1. *Arsenic Chloride Method.*—The oil is measured from a Wright's capillary pipette, graduated by means of mercury to hold 25 c.mm. and delivering 20 mg. oil, into a test-tube of clear white glass of 10 mm. internal diameter. One c.cm. of the reagent (pure $AsCl_3$) is delivered from a standard 10 c.cm. burette into the test-tube and a reading taken immediately (the time limit one minute) in a Lovibond's colorimeter. The results are expressed in standard units (blue) of the colorimeter. Five consecutive tests made in each case differed on the average by $\pm$ 0·10 unit.

2. *Antimony Chloride Method.*—By means of a standard pipette 2 c.cm. of the oil are measured into a measuring flask of 10 c.cm. capacity. The pipette is rinsed out three times with chloroform, and the solution made up to volume with the same solvent; 0·2 c.cm. (=40 c.mm. oil) of the solution are measured into a test-tube (10 mm. diameter) and mixed with 2 c.cm. of a 30 per cent. antimony chloride solution in chloroform delivered from a standard burette. Readings are taken as above described. Limit of error as above.

The values obtained by the $AsCl_3$ method and its $SbCl_3$ modification agree within the limits of error of each method. The results obtained on the same oils by two independent observers agreed within $\pm$ 0·50 units—i.e., the usual difference in colorimetric work. The figures given in the table below refer to the mean of the values obtained with the arsenic chloride and antimony chloride methods respectively.

Biological Method for Vitamin A Assay.

All the workers raised the question of the exact biological method to be employed, and the Accessory Food Factors Committee was asked to give an opinion on this point.

The method for biological assay of vitamin A (anti-xerophthalmic factor) detailed in the memorandum of July, 1925, drawn up by Prof. Poulsson on behalf of the Permanent Standards Committee of the League of Nations Health Organisation, was discussed at a Conference held at the Lister Institute on Dec. 18th, 1925. The Conference was unanimous in the opinion that the method therein described was defective in that no provision was made for an adequate supply of vitamin D (antirachitic factor) to the experimental animals during the period of the test.

The following general method for the biological estimation of vitamin A in the samples of cod-liver oil was therefore recommended and adopted by the four laboratories undertaking the biological tests:—

1. Young rats of weight 40–50 g., 20–30 days old, to be used.

2. The number of control animals to be equal to that in each group receiving oil.

3. The animals to be fed on artificial diet devoid of fat-soluble vitamin until growth ceases, and excess of antirachitic vitamin (in form of irradiation, irradiated foodstuffs, or irradiated cholesterol) to be supplied during the whole or latter part of this pre-observation period.

4. The material to be tested to be added to the diet when growth has ceased and the weight of the animal has become constant or is beginning to decline.

5. The animals to be observed during a further period of four weeks, during which time the antirachitic vitamin should be supplied.

6. Comparison to be instituted between the doses of the various oils required to restore the same rate of growth.

* Report to the League of Nations Health Organisation by the Accessory Food Factors Committee (appointed jointly by the Lister Institute and the Medical Research Council).

[1] Biochemical Journal, 1925, xix., 753.

7. Not less than three animals to be used for each dose of oil. The oil to be administered separately to each animal. The diluent to be some inert solvent, whose inactivity should be controlled by the behaviour of control animals.

The results obtained by the various workers using the biological method are summarised in the accompanying table. It will be seen, however, that the observers did not in all cases find it possible to institute a comparison on the lines laid down in (6) above, and in two instances comparison was made between the *rate of growth* shown by rats *upon the same dose* of the different oils. By this method quantitative accuracy of comparison is impossible, seeing that the relation between size of dose and rate of growth has not been determined. But the oils can be graded in order of merit provided that the dose selected for making the comparison does not exceed the minimum required for normal growth.

RELATIVE VALUES OF SAMPLES OF COD-LIVER OIL IN CONTENT OF VITAMIN A.

—	Laboratory.	Observer.	Method	Vit. D. supplied as—	Cod-Liver Oils. 1	194	202	97	140	114	82	Remarks.
1	Nat. Inst. for Med. Research.	Dr. Rosenheim.	C.	—	100	88	45	34	34	20	0	Expressed in units of blue (Lovibond), mean of values given by AsCl. and SbCl. reactions, using 1 c.cm. reagent and 20 mg. oil.
2	Univ. of Sheffield Pharmacolog. Dept.	Prof. E. Mellanby.	B.	Irradiated cholesterol.	+ + + +	+ + +	+ +	+ +	+ +	+	0	Graded by— Comparison of doses required to restore same rate of growth; 82 has toxic properties.
3	Univ. Coll. Lond. Biochem. Dept.	Prof. J. C. Drummond.	B.	,,		+ +	+ + +	+ +	+	±	0	Comparison of rate of growth on 10 mg. doses.
4	King's Coll. for Women, Physiol. Dept.	Prof. Mottram and Dr. G. Hartwell.	B.	,,		+ + +	+ +	+ +	+ +	+	0	Comparison of rate of growth, general condition and, where possible, post-mortem exam. on 5 mg., 10 mg., 15 mg., and 20 mg. doses.
5	Lister Inst. Dept. of Exp. Pathology (Prof. Sir C. Martin).	Miss K. M. Soames and Miss J. Leigh Clare.	B.	Irradiated hardened cotton-seed oil.	+ + +	+ +	+ + +	+ +	+ +	+	±	Comparison of rate of growth on 20 mg. dose (Lister standard cod-liver oil = + + + +).
6	Univ. of Oslo.	Prof. Poulsson.	B.	Not supplied.		100 (0·5 to 0·75)	66 (0·75 to 1·0)	30 (2)	66 (0·5 to 1·25)	30 (2)		Comparison of smallest growth promoting dose (in mg.).

C. = Colorimetric. B. = Biological.

After the results had been submitted, Dr. Dale communicated the results received from Prof. Poulsson (also included in the table), together with the following description of the various oils :—

Oil 1.—An ordinary medicinal cod-liver oil. Details of preparation not available.

Oil 194.—Raw medicinal cod-liver oil prepared by the ancient "rotting" process. The liver remains in open barrels for many weeks, sometimes for several months. This oil is very strongly coloured.

Oils 202, 97, 140, 114.—Ordinary medicinal cod-liver oils, prepared by means of steam. Nos. 97, 140, and 114 have remained in half-filled bottles for two to three years and may have undergone alterations. No. 202 is a fresher oil and has been kept in filled bottles.

Oil 82.—Cod-liver oil prepared in a very primitive way by simply boiling the cod livers in an open pot. Such cod-liver oil is employed by the inhabitants for their own use.

Results.

The grading of the seven oils for vitamin A value by the English workers using the biological test is roughly the same, but there was a marked variation in the values obtained in different laboratories for the same oil. This variation in the results among themselves was at least as great as that existing between the latter and those obtained for the same oils by the colorimetric method. It was not possible to attach numerical values to the results obtained by the biological method. The colorimetric test gave oil No. 1 the first place and placed oil 194 not far behind. Oil No. 1 was also placed in the first rank by one of the two observers who examined it using the biological method. Oil 194 was found next in value in two out of four biological tests; in the other two oil 202 was found superior to oil 194. The results of the colorimetric test and of all four biological tests agreed (1) in consigning an intermediate position to oils 97 and 140, and (2) determining oil 114 to be inferior to these two, and (3) in finding oil 82 to be either very poor in vitamin A or altogether devoid of it.

The Committee finds the biological method does not, at present, permit of sufficient accuracy for the presentation of the above results in numerical form.

Conclusion.

In the examination of cod-liver oils for vitamin A the colorimetric method of Rosenheim and Drummond afforded information consistent with that derived from the biological tests.

In recording this conclusion the Accessory Food Factors Committee, however, considers that before a conclusion is drawn as to the general validity of the colorimetric method for assay of vitamin A, tests should be made with substances containing vitamin A, other than cod-liver oil, such as butter, palm oil, cereal oils, &c.

F. GOWLAND HOPKINS, *Chairman.*
HARRIETTE CHICK, *Secretary.*

September 1st, 1927.

APPENDIX.

Basal diets (deprived of vitamin A) used for the biological tests as carried out in Laboratories 2-5.

Lab. 2 (University of Sheffield, Pharmacological Department).

Caseinogen	400 g.	Lemon juice	140 g.
Rice starch	800 g.	Salt mixture	80 g.
Cane sugar	240 g.	Liquid salt solution—	
Marmite	160 g.	$CaH_4(PO_4)_2$. 176	160 c.cm.
Olive oil (heated and oxygenated at 120° C. for 12 hours)	160 g.	KI . . 10 Water to 2000 c.cm.	
		Water	700 c.cm.

Vitamin D supplied in the latter period of the test by means of 5 mg. irradiated cholesterol administered daily to each rat.

Lab. 3 (King's College for Women, Physiological Department).

Stock diet. †Certified "A-free" caseinogen 100 g.; Pure potato starch 320 g.; Salt mixture 20 g.

To 22 g. stock diet was added 2·5 c.cm. oxygenated cotton-seed oil, 25 c.cm. 5 per cent. solution of marmite, 50 c.cm. distilled water.

Vitamin D supplied during the whole period of the test by administering 2 mg. irradiated cholesterol (suspended in cotton-seed oil) daily, to each rat.

Lab. 4 (University College, London, Biochemical Department).

†Certified "A-free" caseinogen	20 g.	Salt mixture	5 g.
Rice starch	76 g.	Yeast extract (marmite)	5 g.

Vitamin D supplied as 1 mg. irradiated cholesterol dissolved in liquid paraffin administered separately to each rat daily.

† Prepared by Glaxo, Ltd.

Lab. 5 (Lister Institute, Department of Experimental Pathology).

"F" Diet.

Caseinogen	100 g.	Lemon juice ..	25 g.
Wheat starch	250 g.	Salt mixture ..	25 g.
Hardened cotton-seed oil	75 g.	Water	300 c.cm.
Yeast extract (marmite)	25 g.		

Vitamin D was supplied during the latter part of the test by previously irradiating the cotton-seed oil for 30 minutes at a distance of 33 cm. from the burner of a quartz mercury-vapour arc lamp.

In all cases the caseinogen was purified by heating for 36–72 hours in thin layers at 120° C.

The salt mixtures were all based upon No. 185 of McCollum, Simmonds, and Pitz.[2] In Laboratories 2 and 3 there were also additions of small quantities of sodium fluoride, manganese sulphate, and potassium iodide.

THE RELATIVE CONTENT OF THE FAT-SOLUBLE VITAMINS A AND D IN A SERIES OF COD-LIVER OILS.

By JOAN LEIGH LEIGH CLARE AND KATHARINE MARJORIE SOAMES.

(*From the Department of Experimental Pathology, Lister Institute.*)

THE series of cod-liver oils which form the subject of this investigation was the same as that described in the Report of the Accessory Food Factors Committee on "A Comparison Between the Colorimetric and the Biological Method of Determining Vitamin A in Cod-liver Oil" (see p. 148). The same oils were examined for their content of the antirachitic vitamin D to see whether any parallelism existed between the amounts of vitamins A and D respectively contained in any one oil.

1. *Titration of Vitamin A.*

The method employed was biological and in accordance with the general description given in the Report referred to. The following details may, however, be added:—

Litters of young rats, 3 to 4 weeks old, and weighing between 30 and 40 g., were placed on the basal diet F devoid of fat-soluble vitamins.

Caseinogen	100 g.	Lemon juice	25 g.
Wheat starch	250 g.	Salt mixture* ..	25 g.
Hardened cotton-seed oil	75 g.	Water	300 c.cm.
Yeast Extract (Marmite)	25 g.		

At the end of 14 days the animals were put in separate cages and after a further period of 14 days vitamin D was given in the form of cotton-seed oil irradiated with ultra-violet rays from a mercury-vapour quartz lamp, and incorporated in the diet. The animals were maintained on the diet thus changed until growth had ceased for at least a week or a marked loss of condition or weight had occurred. The oil to be tested was then administered by pipette daily for a month, in doses of 19, 6, and 2 mg., the smaller amounts being diluted with inactivated olive oil. A group of three rats received each dose of oil. The numerical results are given in Table I., and from these was derived the approximate grading given in the table of the preceding Report.

The test on oil No. 1 was carried out in the autumn with young rats which had been born in the late summer and had not, therefore, the same growth capacity as those born earlier in the year. The average weekly increase in weight when receiving an optimum dose (19 mg. daily) of a good cod-liver oil used in this laboratory was only 5·3 g. as compared with 10·2 g. for rats born earlier in the summer.

The degree of accuracy obtainable with the biological method as thus carried out was disappointingly low. There was so great a variation in the behaviour of individual rats treated in exactly the same way that the number in each group would need to be much greater to ensure reasonable accuracy. It is impossible to deprive all animals of vitamin A to exactly the same degree in the preliminary period, and there were great differences in the individual power of response when vitamin A was administered. This was especially so when the doses of cod-liver oil were small. For this reason the results obtained with 2 mg. doses of oil have been omitted from Table I.

The data obtained do not permit a satisfactory comparison to be made *between the doses of the various oils required to restore the same degree of growth*, which is the correct method for quantitative assay of the vitamin. It would be necessary to carry out tests with doses more than three in number and less widely separated. The data given in Table I. do, however, suggest that oils 97 and 194 may be regarded as about three times as potent as oils 114 and 82 respectively, although the figures are not, on the whole, consistent enough to permit of more than a rough evaluation. The oils may, however, be roughly graded by the amount of growth made on the 19 mg. doses. On this basis oils 1 and 202 may be taken as equal in value to the standard cod-liver oil; oils 194, 97, and 140 cannot be discriminated, but appear distinctly inferior to the above and superior to oil 114. Oil 82 appears to contain but traces of vitamin A.

TABLE I.—*Assay of Vitamin A.*

Effect of small daily doses of the various oils upon the average weekly weight increments of rats maintained for four weeks on "F" diet (devoid of fat-soluble vitamins) to which vitamin D was added as irradiated cotton-seed oil.

Oil.	Average weekly growth increments.		Grading of oils according to growth increments on 19 mg. dose standard cod-liver oil = 100.	Average weekly loss in weight of control rats on basal diet without addition.
	6 mg. dose daily.	19 mg. dose daily.		
	g.	g.		g.
Standard	..	5·3	..	−2·5
1	7·4	7·7	100+	..
Standard	..	10·2	..	−7·1
202	2·0	12·0	100+	..
194	2·1	7·0	69	..
97	4·1	6·4	63	..
140	− 0·8	6·7	66	..
114	− 1·8	4·3	42	..
82	−12·3	1·74	1·7	..

2. *Titration of Antirachitic Vitamin D.*

Vitamin D was assayed by three methods.

METHOD 1.—The vitamin was estimated by the increase in bone calcification occurring after small doses of the various oils had been administered to young rats upon McCollum's (1921) No. 3143 low-phosphorus, rickets-producing, diet (wheat 33, maize 33, gelatin 15, wheat gluten 15, $CaCO_3$ 3 and NaCl 1, parts by weight). After three to four weeks upon this diet, if no vitamin-D-containing substance is added, young rats invariably develop a degree of rickets which can be recognised histologically, while chemical analysis reveals a very low calcium content in the bones.

Young rats of about 40 g. weight received this diet for 23 days. In one control group of eight rats (negative control group) no cod-liver oil was given. In another control group of eight rats (positive control group) 19 mg. daily of the standard cod-liver oil was given. In 21 other groups containing three rats each the individuals received, respectively, 2, 6, and 19 mg. daily of the seven oils to be tested. After 23 days the rats were killed and estimation made of the ash in the fat-extracted leg-bones (femur, tibia, and fibula) after the method described by Chick, Korenchevsky, and Roscoe (1926). The results are given in Table II.

McCollum's No. 3143 diet, however, while deprived of vitamin D, is also deficient in vitamin A and has a defective salt mixture, in that the content of phosphorus (0·30 per cent. P. on the dry weight) is too low both in absolute amount and also in relation to the proportion of calcium contained (1·22 per cent. Ca on the dry weight). It does not, therefore, fulfil the requirement that in the biological assay of a vitamin the basal diet should contain optimal

[2] Journal of Biological Chemistry, 1917, xxix., 341.
* No. 185, McCollum, Simmonds, and Pitz, 1917.

amounts of all essential substances except the one which is the object of study.

As a result of attempts to discover a diet for use in assay of vitamin D, which should fulfil this condition, we came to the conclusion that wheat embryo, first suggested by Miss E. M. Hume, is the best means of supplying vitamin A without furnishing more than a negligible quantity of vitamin D and preferable to hog millet or alfalfa meal, which were investigated by Steenbock, Nelson, and Black (1924).

METHOD 2.—The vitamin D content of the same cod-liver oils was assayed with the use of a diet modelled upon diet F (see above), to which 20 per cent. wheat embryo was added. The proportion of caseinogen and wheat starch was reduced so as to leave the balance of protein and carbohydrate unchanged. On this basal diet rickets does not usually develop, but the lack of vitamin D can be detected by the lowered ash content in the bones of the experimental animals at the close of the experiment. The test was carried out as follows :—

Young rats about 23 days old weighing 35–40 g. and derived from 14 litters, were arranged in 23 groups with the two sexes and different litters as evenly represented as was possible. Twelve rats in the "negative" control group received no addition to the diet and nine rats in the "positive" control group received 19 mg. daily of the standard cod-liver oil. Each of the 21 other groups contained four rats receiving, respectively, 2, 6, and 19 mg. daily of the seven cod-liver oils. After eight weeks the rats were killed and the ash content of their bones was determined.

TABLE II.—*Antirachitic Vitamin D Content of Cod-liver Oils.*

Average percentage ash in fat-extracted dry bones of young rats receiving various daily doses of the different oils after being maintained for—

Oil No.	23 days on McCollum's 3143 diet. (Method 1.)			55 days on "F" diet containing 20 % wheat embryo. (Method 2.)		
	2 mg. dose.	6 mg. dose.	19 mg. dose.	2 mg. dose.	6 mg. dose.	19 mg. dose.
1	31·8*	37·5*	41·2*	57·4	61·1	62·5
194	31·3	35·0	39·3	55·7	57·7	61·2
202	32·3	40·5	40·8	51·6	53·6	62·1
97	31·4	41·3	37·7	56·5	61·2	61·8
140	31·8	40·9	42·6	54·4	58·3	61·3
114	31·5	34·2	38·6	57·8	58·1	61·0
82	30·8	32·8	38·8	52·1	53·2	61·4
A	..	..	(40·4)	..	..	(6 3·8)
B	(27·1)	..	..	(49·5)	..	..

A = Standard cod-liver oil, "positive" control.
B = No addition of oil to diet, "negative" control.
* Positive control, 44·1 ; negative control, 25·3.

The results obtained with methods 1 and 2 are set out in Table II. In attempting to draw quantitative conclusions, however, the same difficulty arose as was encountered in the assay of vitamin A. The variation in the ash content of bones of rats upon the same ration was frequently as great as that existing between the averages calculated for rats in different groups. Nearly 200 rats were used in the attempt to assay these oils for content of vitamin D, and it is probable that two or three times this number would be necessary to enable any quantitative comparison to be instituted which should possess a reasonable degree of accuracy.

If, however, average ash content of bone be plotted against daily dose of each oil, graphs are obtained from which a rough estimate can be made of the dose which might be assumed to correspond to any definite value of the ash content of bone. This was done with the results obtained by method 2. The value selected was 57 per cent. of the dry weight of the fat-extracted bone, a value about midway between that shown by the "negative" and "positive" control rats respectively. The oils as investigated by method 2 then range themselves as shown in Table IV.

METHOD 3. *Assay of Vitamin D by Increase in Body-weight.*—Steenbock and his collaborators (1923, *a*, *b*) were the first to insist that, as is the case with other vitamins, the presence of the antirachitic vitamin D in the diet was essential for normal growth of the young rat. They have also used increase in weight as a criterion for the detection of vitamin D. The experimental animals must, however, be maintained on a diet otherwise complete and including, of course, an adequate provision of vitamin A. The growth made by the rats used in method 2 has, therefore, been studied with this view and the results are collected in Table III.

Here, again, the variation shown by individual rats in the same group was sometimes found to be as great as that occurring between the averages calculated for the different groups. In the main, however, the results which are summarised in Table IV. may be said to agree with those derived from analysis of the bones.

TABLE III.

Vitamin D in cod-liver oils (method 3). Average weekly increase in weight (in grammes) of young rats maintained for eight weeks on Diet "F" containing 20 per cent. of wheat embryo with supplementary doses of cod-liver oil.

Oil.	Dose given daily—		
	2 mg.	6 mg.	19 mg.
Standard* ..	..	..	17·2
1	13·2	16·8	19·3
202	8·6	9·9	15·8
194	11·4	14·2	15·8
97	12·4	15·5	18·1
140	10·1	13·1	17·4
114	9·8	12·6	17·0
82	8·1	9·1	14·8

* Positive control rats. Negative control rats, 7·3.

Comparison of Table IV. with Table I. shows that no correlation exists between the vitamin A content and the antirachitic value of this series of cod-liver oils. Oils 82 and 1 are the poorest and best oils respectively as regards both vitamins. Oil 202, however, which was equal to oil No. 1 in vitamin A content, is only equal to oil 82 in antirachitic value, and oil 114, which was definitely inferior to oils 194 and 140 in vitamin A content, is found to be their equal in antirachitic value.

TABLE IV.—*Antirachitic Value of Cod-liver Oils.*

Criterion.

Daily dose required to raise the ash content of fat-extracted bones from 49·5 per cent. (negative control rats) to 57 per cent. (Method 2.)				Daily dose required to maintain growth of approximately 12 g. weekly. (Method 3.)			
Oil.	Dose mg.	Oil.	Dose mg.	Oil.	Dose mg.	Oil.	Dose mg.
1	2	82	11–12	1	2	82	13
97	3	202		97	2	202	15
194	5	—	—	194	3	—	—
114				114	4	—	—
140				140	6	—	—

Conclusion.

The experiments described in this paper have demonstrated how small is the degree of accuracy which it would seem possible to attain with the biological methods at present available for assay of vitamins A and D, unless a prohibitive number of animals is used. Notwithstanding this drawback the results leave no doubt in our minds that the content of vitamin A in cod-liver oil bears no necessary relationship to that of vitamin D.

This lack of parallelism between the content of these vitamins may be explained, in part, by the fact that vitamin A is less stable than vitamin D and, therefore, more likely to be affected adversely by methods of preparation and storage which involve heat and oxidation. Oil 202, one of the oils poorest in vitamin D, while richest in vitamin A, was also one of the freshest of the oils and had been kept in filled bottles (see report, p. 148).

The medicinal worth of cod-liver oil depends more upon its antirachitic value than upon its content of vitamin A, for the latter is readily and more conveniently obtained from foodstuffs. If the amount of one of these vitamins in a particular oil bears no necessary relationship to the other, as from our experiments we believe to be the case, the biological method of testing cod-liver oil laid down in the United States Pharmacopœia, which aims at the assay of vitamin A only, is open to criticism.

We have much pleasure in thanking Sir Charles Martin and Dr. Harriette Chick for suggesting this research and for the large measure of help and advice given to us by them throughout the experiment, and in thanking also Dr. H. H. Dale, of the National Institute for Medical Research, for supplying the samples of cod-liver oil. We have also to acknowledge our indebtedness to the Medical Research Council for a whole-time grant and to the Lister Institute for the hospitality of its laboratories.

References.

Chick, H., Korenchevsky, V., and Roscoe, M. H.: Biochem. Jour., 1926, xx., 622.
McCollum, E. V., Simmonds, N., and Pitz, W.: Jour. Biol. Chem., xxix., 341.
McCollum, E. V., Simmonds, N., Shipley, P. G., and Park, E. A.: Jour. Biol. Chem., 1921, xlvii., 507.
Steenbock, H., Nelson, E. M., and Black, A.: Ibid., 1924, lxii., 275.
(*a*) Steenbock, H., and Nelson, E. M.: Ibid., 1923, lvi., 345.
(*b*) Steenbock, H., Sell, M. T., and Jones, J. H., Ibid., 1923, lvi., 355.

MEDICINE AND THE LAW.

Fishing Vessels and Dangerous Drugs.

THE Dangerous Drugs Act Regulations of 1921 dealt specially with the case of ships not carrying a duly qualified medical practitioner. The Regulations recognised the master of the ship as a person authorised to be in possession of drugs so far as necessary for complying with the requirements of the Merchant Shipping Acts. The master was allowed, subject to conditions prescribed by the Home Office, to administer and supply the drugs to any member of the crew in accordance with instructions prepared or sanctioned by the Board of Trade. In August, 1921, the Home Office granted an authority to skippers of British fishing vessels to be in possession of tinctura chloroformi et morphinæ composita and tinctura opii. That authority has been revoked by the Home Office as from the beginning of the present year. It is replaced by an authority, dated Dec. 30th last, granting the owner of a British steam fishing vessel registered under the Merchant Shipping Acts formal permission to be in possession (for first-aid purposes and for treating injuries to the eye) of a preparation containing cocaine. The preparation consists of cocaine in castor oil with mercuric chloride in the proportion of not more than 1 part in 200 of cocaine and not less than 1 part in 3000 of mercuric chloride. The preparation must be kept under lock and key at the owner's office or place of business; it must be obtained only in quantities sufficient for the vessels concerned, and it must be used for this purpose and no other. Written records must be kept and produced for inspection when required. This new authority by the Home Office has to be read with the Board of Trade notice (No. 90) of August last which prescribed scales of medicines and medical stores for steam fishing vessels absent from the United Kingdom for four days or more. The scales included a first-aid case containing inter alia one ½-ounce bottle of cocaine eye-drops. Under the Dangerous Drugs Regulations the skipper of a fishing vessel to which the Board of Trade scales apply had authority to purchase the necessary supplies of eye-drops. It was found, however, that it is usually the owner or manager who purchases the medical stores, and not the skipper. The recently issued authority is intended to meet this difficulty. "Owner" is defined to mean the registered owner of the vessel or, where a managing owner or manager is appointed, the managing owner or manager.

CANCER OF THE RECTUM.

TREATMENT AND ITS RESULTS.

THE latest report [1] issued by the Ministry of Health is based on the examination of nearly 6000 cases of rectal cancer in which operations for radical cure were performed. The data were collected from ten different countries and the inquiry was conducted by the Departmental Committee on Cancer,[2] which specially acknowledges the assistance given by Dr. F. J. Darbyshire, who examined and abstracted the literature, by the Surgical Statistics Subcommittee, and by Dr. Janet Lane-Claypon and Prof. Major Greenwood. The report covers 70 pages and is a sequel to those on cancer of the breast and uterus [3] which have at various times been summarised in our columns.[4] The principal facts elicited and conclusions reached are as follows.

Operability.

Even now there are no general accepted criteria of operability, each surgeon being guided largely by his personal experience and the type of operation which he practises. Fixation of the rectum, for instance, is regarded by some as the chief contra-indication to operation, the height of the growth being of minor importance, whilst others consider that fixation may be due entirely to inflammatory changes, as is shown, they claim, by the restoration of mobility after colostomy. Information as to operability is given in 5231 of the cases whose records have been examined. When these are grouped under countries of origin the operability varies from 35 to 67 per cent., with a mean for the whole series of 48·5 per cent. It should be remembered that some of the data used in reaching these figures are more than 50 years old.

There seems to be general agreement that the mean operability is higher for women than for men, owing, it is said, to the greater roominess of the female pelvis and its superior resistance to infection. This opinion is borne out by the available information, which is, however, "very limited."

Operative Mortality.

For the purposes of the inquiry deaths have been considered "operative deaths" if they are so described by the author, or (in the absence of any such statement) if they occur within one month of operation. On this basis the operative mortality for 5240 cases of radical operation is shown to be 16·5 per cent. The mortality for 860 males was 18·9 per cent., whilst for 538 females it was only 15·0. The operative mortality (both sexes together) is found to be heaviest (32·0 per cent.) in the case of the combined operation and lightest (15·4 per cent.) in the case of the sacral operation, the perineal operation being intermediate (17·4 per cent.). When the two sexes are considered separately the above order holds good for males, but the lowest operative mortality for females belongs to the perineal rather than the sacral operation.

In view of the difficulties of definition it was decided that growths of the pelvic colon and rectum proper should be considered together. A classification according to position was adopted, the tumours being grouped according to distance from the anal margin. The three groups correspond approximately to anatomical segments of the gut. The first group, described as "low," refers to the area lying within 1½ in. of the anal margin—i.e., in general the anus

[1] Ministry of Health: Reports on Public Health and Medical Subjects, No. 46. H.M. Stationery Office. 1s. 6d. net.
[2] The Committee consists of Sir George Newman (chairman), Mr. C. J. Bond, Sir George Buchanan, Dr. S. Monckton Copeman, F.R.S., Prof. Major Greenwood, Sir Gowland Hopkins, F.R.S., Prof. W. S. Lazarus-Barlow, Dr. J. A. Murray, F.R.S., Dr. T. H. C. Stevenson, Dr. Stanley Wyard, and Lieut.-Colonel A. B. Smallman, M.D. (secretary). Additional members for the Surgical Statistics Subcommittee are Sir Gilbert Barling, Dr. T. Watts Eden, and Mr. E. W. Miles.
[3] Reports on Public Health and Medical Subjects, Nos. 28, 32, 33, 34, and 40.
[4] THE LANCET, 1924, ii., 708; 1926, i., 618; 1926, ii., 187, 611, and 672; and 1927, ii., 288.

and anal canal; the second "middle," refers to that between 1½ in. and 4½ in. of the anus, and therefore takes in the ampulla and anything within reach of the examining finger; whilst the third group, "high," comprises those more than 4½ in. from the anal margin, including the rectosigmoidal junction. These terms refer to the lower margin of the tumour. The following table for 1769 cases shows that the higher the growth the higher the operative mortality:—

Site of Growth.	Total No. of cases.	Percentage at this site.	Died from operation.	Operative mortality.
Low ..	550	31·09	67	12·28
Middle ..	1004	56·76	168	16·79
High ..	215	12·15	55	25·50

Data relating the stage of the disease to the operative mortality are given by one surgeon only, but tend to show that the operative mortality is higher for cases in an advanced stage of the disease. Of the immediate causes of operative death "sepsis" is found to be much the most important, being responsible for nearly half the deaths from operation. "Shock and collapse," the next cause in order of importance, accounts for a little more than half the deaths due to "sepsis."

Fate of Patients Submitted to Radical Operation.

For the purpose of this estimation it was decided to reject all patients who had been operated upon before 1890. Of 2344 other patients about whom the necessary information is available, 39·9 per cent. are estimated as having been alive three years after operation. The percentage varied in different countries from 26·9 to 51·4.

The results of the perineal and sacral operations are found to be practically the same up to the end of the second year, but after that the perineal operation has an advantage over the sacral. Females are found to do much better after the perineal operation than after the sacral. The figures for the combined operation are too small to allow of any definite deductions. The prospects of survival are better for females than for males at all periods after radical operation.

Analysis of 2543 cases submitted to radical operation during the past 50 to 60 years shows that the average number of years lived per patient up to the end of five years after operation was 2·53. On the other hand, it has been estimated that the corresponding figure for the untreated patient is 1·59 years, so that on the average radical operation prolongs the life of a patient by 0·9 year (for patients dying within five years). These figures are less favourable than the reality because they leave out of account the number of years still to be lived by those who survive for more than five years.

Symptoms.

Much the commonest first indications of cancer of the rectum are irregularity of stool, pain (not at stool), and blood in the motions, in the order named. These three signs and symptoms taken together account for 84·5 per cent. of the 1244 cases for which this information is given. Of the later indications of the disease, irregularity of stool, blood in the motions, and pain are found to be the commonest, in the order named, and account for 64·5 per cent. of the 3828 cases for which this information is given.

This clearly shows the great importance of carrying out a thorough examination at the first opportunity of all patients—or, at any rate, of those over 30 years of age—suffering from blood or pain at stool, constipation or diarrhœa, or pain in the anal canal, rectum, perineum, sacrum, or abdomen, in order to detect or exclude the presence of cancer of the rectum. The fact that cancer of the rectum, like cancer at other sites, has no peculiar symptoms or signs, undoubtedly adds to the difficulty of diagnosis, but it does not in any way absolve the patient's medical attendant from the duty of carrying out a thorough examination at the earliest possible moment if any of the chief early indications are present. The statement often made that cancer of the rectum is a painless disease, at any rate in its earlier stages, is in direct opposition to the evidence.

Summary.

In his preface to the report Sir George Newman summarises the principal findings as follows:—

(*a*) On the average a period of 12 months was allowed to elapse between the occurrence of the first symptom of the disease and the patient coming to operation. (*b*) Rather less than half the cases when seen by the surgeons were considered to be operable. (*c*) About a sixth of all the patients who underwent a radical operation died as the result of such operation or from causes connected with it. There is no doubt, however, that it should be possible to secure a considerably lower operative mortality at the present time. (*d*) There is evidence, though limited, to show that the mortality from operation was much higher than the average among those patients who are in an advanced stage of the disease. (*e*) Two out of every five of those submitted to radical operation were alive three years afterwards. He points out that no evidence has been forthcoming to ratify the common belief that rectal cancer is of graver import in young persons than in older ones and draws special attention to the fact that, with the exception of irregularity of the bowels, pain is the commonest first indication.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Austrian Health Statistics.

AT one of the recent sittings of the National Assembly the chief of the Austrian Board of Health gave some interesting facts and figures about insurance and the public health. The number of persons insured against illness under the Working Men's Insurance Act was, he said, over 1,000,000, whilst 200,000 more were covered by the Shop and Trade Assistants Act. The number of the insured members of the civil services was 170,000; the railway servants and officials insured against sickness numbered 150,000, and there were also 180,000 labourers and officials insured in agricultural sick clubs. Altogether, 1,700,000 persons were thus under the control of public *Krankenkassa*, or national insurance. Adding to this figure the number of dependants (members of family who enjoy the benefits of the insurance of the chief of the household) it appears that at least 3,500,000, or 55 per cent., of the total population of this Republic are receiving medical aid under one or other form of insurance and are thus lost to the private practitioner (which explains the constant unsettled condition of the profession). The annual expenditure on this welfare care amounts to about £6,000,000 for the labourers, and nearly £3,000,000 for the trade assistants, employers and employed contributing in equal proportions.

Last year proved fairly free from serious epidemics of contagious or transmissible diseases, and no case or cholera, typhus, or small-pox has been imported into this country; diphtheria has rather increased (from 3755 cases in 1926 to 5051 in 1927), and so has scarlet fever, but both have taken for the most part a rather mild course. The number of typhoid cases is constantly decreasing, and the hope is justified that with improvement of the water-supply it will diminish still further. Trachoma is endemic in the south-eastern province of Austria, which has been taken over from Hungary, and the progress of public health in this region is very slow and difficult, owing to the low standard of living of the population. The number of cases of acute poliomyelitis, which was rife last year in the Balkans and also in Central Europe, has fortunately not risen above 130, so that there is and was no need for anxiety. As regards venereal diseases, the figures of the hospitals show a constant decline. In 1925, the total number of patients treated in the State hospitals for venereal

diseases was 6246 for syphilis and 6028 other sexual diseases, whereas in 1926 the numbers were 5706 syphilitic and 5747 other cases. Incidentally, it may be mentioned that in 1925 the number of prostitutes controlled by the police in Vienna was 1097, and in 1926 only 1014. A considerable increase in the consumption of alcoholic beverages has been noted in the past year, especially of heavy beer and cognac. The reports of the Ministry of Agriculture and the Customs Board also show that large quantities of heavy wines have been imported, and the police officers have dealt with over 16,000 persons found drunk in Vienna alone, of whom over 2 per cent. were juveniles.

The war has left us a sad inheritance; there are 53,259 war invalids besides 31,864 war widows, 69,593 orphans, and 24,192 dependants of men who died in action or from war diseases. All these persons are receiving pensions.

Tetanus.

Dr. O. Hock has recently published a short paper on work done in the accident ward of the first surgical clinic of the University of Vienna, which is directed by Prof. Eiselsberg. He deals chiefly with the cases of tetanus, of which only 25 have been observed during the last 20 years. Nine of these proved fatal, four of the patients being admitted with fulminating signs of the disease, and dying from 24–56 hours after the first symptoms developed. In all these cases there had been very extensive destruction of the soft tissues after severe injuries, and post-mortem no other lesion was found except a hyperæmic condition of the brain. In the other five cases, however, pneumonic and cardiac changes were observed. All the patients, with one exception (in which only the masseteric muscles were affected), suffered from severe general tetanus with trismus, opisthotonus, and spasms of the diaphragm and other muscles. The treatment given always includes injections of at least 100 units of tetanus antitoxin daily, given by subcutaneous, intravenous, or intraspinal injection, followed by chloral hydrate per rectum. Injections of morphia or pantopon are given freely, and novocaine is injected into the masseters if trismus is present. Absolute rest in a dark room is required. Every patient with an injury suggestive of tetanus receives an injection of 20 units of antitoxin as a prophylactic measure; this is sufficient either to prevent the disease from developing or to make its course very mild. This prophylactic dose was employed in 1300 out of 4655 cases of accident treated last year, and tetanus developed in only four of them. The sole drawback to its use is a disagreeable itching, occurring in some cases a few days after the injection together with a serum rash.

Diagnosis and Prognosis of Syphilis of the Aorta.

The problem presented by aortic syphilis in large cities was discussed by Prof. H. Schlesinger at a meeting of the Vienna Medical Society a short time ago. It is a mistake, he said, to judge of the influence and frequency of syphilis from the figures obtained in the post-mortem rooms for these are very misleading and give only the minimal figure. In a series of necropsies in Germany, for instance, undoubted syphilitic changes were found in only 2·5 to 5·5 per cent. of the bodies, whereas clinical investigation of large numbers of patients proved that in the later age-periods from 10 to 15 per cent. had been infected. Prof. Schlesinger finds that 14 per cent. of the patients in his wards have syphilis, the males being more often affected than the females, and he thinks that 10 per cent. of the Vienna population suffers from the disease in a recent or chronic form. The Wassermann reaction, he says, only gives a positive answer in 75 per cent. of cases and a negative result does not denote absence of infection. Of late years cutaneous manifestations have been much less common and the organism more often affects the central nervous system and the circulation. Intensive treatment seems to be responsible for the change; it diminishes the interval between infection and the manifestation of aortic disease, and in the last 20 years statistics of necropsies show a rapid increase of aortitis, which is now by far the most common form of luetic disease of the internal organs. Diagnosis is generally easy, unless severe atheroma is also present; prognosis is better than is usually supposed, especially in aortitis supracoronaria, and sometimes the condition is actually benign especially when it is accompanied by neurosyphilis. Many patients have hardly any symptoms for years, but the condition is always dangerous, as over half the affected persons ultimately die from the effects of the aortic changes. Antiluetic treatment improves the prognosis slightly, and good effects are seen in aortalgia, and in stenocardia; aortic aneurysm is often well controlled for a long while. Mild treatment, said Prof. Schlesinger, is better than intensive, and not more than 3·5 g. of neosalvarsan should be given in the course of treatment. Failing cure, it is often possible to ensure quiescence of the pathological processes in the blood-vessels.

Public Health Services.

COÖRDINATION OF THE PUBLIC HEALTH SERVICES.

In the counties of Essex, Hampshire, Gloucester, and West Sussex an assistant of the county medical officer acts also as medical officer of health for one or more local sanitary areas in the county. Dr. James Pearse has investigated for the Ministry of Health how this arrangement is working, and has come to the following conclusions[1]: 1. The local authorities within the districts investigated have almost unanimously expressed their satisfaction with the scheme, and approval has been especially marked from authorities zealous in public health activity. 2. In no district have difficulties been experienced from the dual relationship of the medical officer to the district councils and the county council. Some authorities have expressed the view that there is advantage in the liaison effected. 3. The making of a combined appointment reduces the number of officials working in a given area, increases the opportunities for efficient work in each of the appointments combined, and reduces the difficulty sometimes met by members of the general public who may need official assistance, but may not know where to find it. 4. An officer holding a combined appointment has the advantage of a wider outlook and larger range of official interests, and in particular the independence proper to a medical officer of health relieves in this respect the monotony and the less responsible work of the assistant to a county medical officer. 5. The public health services must benefit by improvement of the opportunities thus offered to new recruits. 6. The definite advantages of the system are such as to merit its continued encouragement, and the taking of such steps as may be necessary to prepare for its further and more uniform development.

THE REGISTRAR-GENERAL'S WEEKLY RETURN.

We have made a practice of calling attention to this useful publication for some time past at the beginning of every year. The first Weekly Return for 1928 does not contain any startling innovations of type or arrangement, but it does include on p. 3 a new and useful feature in the table of comparative death-rates in the eight largest towns for each of the four weeks previous to publication. A further useful addition is the inclusion in Table 5 of the number of live births and of stillbirths occurring in London during each week of the preceding quarter; this table, too, with

[1] Report No. 45 on Public Health and Medical Subjects. H.M. Stationery Office. 1928. 6*d*.

a little compression now allows room for two columns, one of which gives the total cases and total deaths from important infectious diseases during the year as far as it is already completed, with the corresponding figures for last year. The Weekly Return is, of course, supplied to sanitary authorities and their medical staff, but there must be many practitioners who would find it useful to keep it at hand for reference, if only for the reason that their lay friends are making increasing use of the information which it contains. The price is 6*d*. net per issue, from H.M. Stationery Office.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JAN. 7TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 275 (last week 247); scarlet fever, 1715; diphtheria, 1376; enteric fever, 53; pneumonia, 2252; puerperal fever, 44; puerperal pyrexia, 104; cerebro-spinal fever, 12; acute poliomyelitis, 8; acute polio-encephalitis, 2; encephalitis lethargica, 31, dysentery, 10; ophthalmia neonatorum, 98. There was no case of cholera, plague, or typhus fever notified during the week.

The cases of small-pox were notified from 16 counties—viz., Berks 1 (Reading), Derby 11, Durham 35, Isle of Ely 5 (North Witchford R.D.), Lancaster 33, Lincoln, parts of Lindsey 3, Northumberland 11, Nottingham 15, Stafford 3 (Stoke-on-Trent), Sussex West 13 (East Preston R.D.), Warwick 10, Yorks N. Riding 14, W. Riding 43, Brecknock 8, Glamorgan 15, Monmouth 55.

In Sussex the original source of infection is stated to have been the East Preston Poor-law Institution (in which union Worthing is situated), which has been closed in consequence. It is not known where the man who introduced the infection into the county contracted the disease, but at least one other case has been notified in another part of the county. This was one of three casuals who went to Horsham from Brighton and entered the Steyning Poor-law Institution at Shoreham. Here there were 13 casuals, 7 of whom were vaccinated; the other 6 (including the 2 from Brighton) refused to be vaccinated, and these 2 who have been detained also refused to have their clothes disinfected. The men have been isolated and the casual ward closed. Local authorities in Sussex are actively coöperating in preventive measures.

Since then a case of small-pox has been reported from the Edmonton Poor-law Institution.

Deaths.—In the aggregate of great towns, including London, there was one death from small-pox, 5 (2) from enteric fever, 107 (44) from measles, 4 (1) from scarlet fever, 32 (8) from whooping-cough, 68 (18) from diphtheria, 61 (8) from diarrhœa and enteritis under two years, and 155 (30) from influenza. The figures in parentheses are those for London itself. Of the 63 fatal cases of measles outside London 14 were reported from Bristol, 5 from Derby, 14 from Manchester, 3 each from Salford and Plymouth, while the figures from Glasgow and Dublin for the same week were 40 and 18 respectively. The deaths from enteric fever outside London occurred in Reading, Norwich, and Chester, one each. The death from small-pox occurred in a poor-law institution just outside the Bradford county borough boundary. The number of stillbirths registered during the week was 277 in the great towns, including 46 in London.

BRIGHTON HOSPITALS AND RATES.—The revaluation of the borough is viewed with considerable alarm by the governors of the hospitals in Brighton. These institutions have hitherto been rated at a purely nominal figure, but now under the revaluation scheme startling increases have been proposed. The assessment of the Sussex County Hospital—the largest in the town—is to be increased from £64 to £3375, a rise of 5000 per cent., and other hospitals are similarly affected. It is not yet clear how the situation will be met. The Brighton figures have been forwarded to the Government Central Valuation Committee, a body which is collecting information about the practices hitherto adopted in various areas in regard to the assessing of hospitals and kindred institutions.

Correspondence.

"Audi alteram partem."

COMMISSIONS IN THE R.A.M.C.

To the Editor of THE LANCET.

SIR,—Major W. E. Home called attention in your last issue to the fact that the list of applications for commissions in the R.A.M.C. closes on Jan. 20th. Although the primary object of the Medical Service is to furnish the army with medical officers for carrying out the various duties in connexion with it, yet, after the South African War, chiefly through the energetic influence of Sir Alfred Keogh, a further and special duty for the education and training of the entrant was thrown upon the Medical Service, and the R.A.M.C. was established. That addition, involving a great change, would not have proved beneficial had it not been attended with facilities for keeping abreast of the work done in medical science in civil life and for carrying on a constant and never-ceasing inquiry into conditions and disease that either are not or are but ill-understood. In the R.A.M.C. that has been attained. I observe some signs that that standard will not, in future, be maintained owing to the reduction in the personnel to a number that is uneconomic, and to the pressure of political circumstances the moment it is realised the educational organisation might be abolished. And unless the service as it is attracts the good if not the best men turned out of the medical schools there will be no excuse for the maintenance of the present educational organisation the like of which there is none.

Indeed, the organisation is magnificent, but the scope for employment after the training is far too narrow, with the result that stagnation occurs. The initial training is unique; the opportunities for seeking new knowledge, for gaining incomparable experience in diverse directions, for leisure to deliberate over work done and that to be done are almost beyond the conception and belief of the medical student. Would-be entrants are, however, few, and there is no competition for places.

This result seemed to me, a few years ago, inevitable. It may well be asked who is there better fitted for hospital appointments, for the public health services, for many other than strict medical duties under several Government departments overseas as a well-trained officer of the R.A.M.C.? Yet, for the trained there are but few channels at present open for him to enter in which there is a prospect of employment of a permanent nature. There are indeed openings in many directions beyond the services for the army in times of peace for which the R.A.M.C. officer is eminently suited and qualified; and it is even now a great loss to the State that his services are not in demand, and early in his career.

I am convinced more extensive use should be made of the great and valuable educational organisation built in relation to the R.A.M.C. than is possible under present conditions. Unless this organisation can be fully utilised I fear that before long the cry for economy will affect it. Scrapping would be calamitous and end in the destruction of an instrument by means of which all medical officers for State services should be trained as a condition of entry for permanent employment under usual conditions. The State needs this additional organisation attached to the R.A.M.C., so that the doctors who desire to enter any of the State services shall have opportunities to fit them for the work that would fall to their lot at home as well as overseas.

The greatest attraction of all would, I believe, be a prospect of permanent employment which none but the State can find, organise, and utilise to advantage.

I am, Sir, yours faithfully,

JOSEPH GRIFFITHS,
Colonel, R.A.M.C.

Cambridge, Jan. 14th, 1928.

THE PRESENT POSITION OF THE VOLUNTARY HOSPITAL.

To the Editor of THE LANCET.

SIR,—In reply to the numerous critics who have written in opposition to the views expressed in my address which you published on Dec. 17th, 1927, I would point out that the thesis which I was supporting was that the voluntary system of management of hospitals, because of its present well-established position and success, was preferable to any other system of management. I would emphasise the word "management," because I consider that is the key-note of the whole question; how large a measure of their funds is derived from voluntary contributions is of less importance, as long as their management remains voluntary.

In answer to Prof. Berry, I would point out to him that my statement to which he objects, that the alternative to the voluntary system of management is bureaucratic control, is in fact correct. For our country that is the precise alternative which is being actively pressed at the present moment. The support of the voluntary system is for this reason of paramount importance, as constituting the only competing system actually in being, and exhibiting sufficient strength (I believe) ultimately to prevail against that formidable bureaucratic menace. Prof. Berry is really upon my side, for he and I both find bureaucratic control "detestable." We differ only in the measures which should be adopted to prevent the extension of that "detestable" control in this country. Like Prof. Berry, I have some first-hand knowledge of American and Canadian hospitals, but my knowledge is not so recent as his. The one instance of somewhat superfluous antisepsis which I quoted was vouched for by a famous Canadian surgeon who named the hospital and obviously described what he had seen. But I readily admit that this instance could not be now regarded as typical of American hospitals.

Those of my critics who make it a reproach to the voluntary hospitals that "they cannot deal with more than 20 per cent. of the work which comes to them" do not seem to realise that the congestion which explains such a position is largely due to the enormously increased popularity, as compared with other institutions, of the voluntary hospitals; they have long waiting-lists, while there are hundreds of permanently empty beds in the poor-law infirmaries. The attitude of these critics reminds me of an incident which others will recall as well as myself. In 1913 the Senate of the University of London invited Prof. Delbruck, of Berlin, to give two lectures in London upon military history. At the conclusion of the second lecture the then Vice-Chancellor invited the lecturer and some half-dozen members of the Senate, of whom I was one, to an impromptu dinner at a club. In the course of after-dinner conversation Delbruck commented with extreme bitterness upon the relative prosperity of the British, as compared with the German, colonies in Africa, and he ascribed the inferiority of the latter to the poorness of the territory which Germany had acquired as compared with England. The German colonies, he said, were relatively empty of colonists. I ventured to suggest, speaking from personal experience, that this was perhaps due to the fact that even Germans did not always like autocratic German rule, and that I myself knew many Germans who had migrated from German South-West Africa to British South Africa to settle there. The remark produced an explosion of wrath from Delbruck. Thumping the table with his fist he said, "I know that, but it is for the good of the Fatherland that Germans remain in German territory and they *shall* like it." We remain a relatively free country, not yet entirely at the mercy of our bureaucrats, and at present there is no means of compelling patients to enter poor-law hospitals when they prefer to wait their turn for admission at the voluntary hospitals. The remedy surely would be to provide more accommodation at the hospitals where admission is eagerly desired than to seek to enlarge the accommodation at hospitals in which there are already vast numbers of empty beds which cannot be filled.

The only specific accusation in Mr. Mort's letter which seems to call for reply is that I have "described a condition in a small area of London and from that erroneously generalised for the whole of the country." My address, however, in its opening paragraphs, gave chapter and verse for the conclusions which two Parliamentary committees, after taking much evidence deliberately formulated—viz., "that the voluntary system should be maintained." I invite Mr. Mort to refer to my paper again and to look up the references I gave there of the evidence in support of that thesis, which was also mine, evidence derived from all over the British Isles.

I remain an impenitent believer in the value of tradition and experience. I will say without hesitation that I am convinced there *is* a larger measure of "humanity and the spirit of service" to be found in the average voluntary hospital than in the average poor-law institution. Again, if I understand aright an obscurely worded question addressed to me by Mr. Mort, I would answer that if I had appendicitis myself, I would rather be operated upon, let us say, in St. Bartholomew's—the oldest of the voluntary hospitals—than, let us say, in the North Middlesex Hospital. That prejudice would, I think, be shared by many. Perhaps Mr. Mort might read with profit, and a certain chastening, the tragic story of an operation for appendicitis in Sir Frederick Treves's book, "The Elephant Man."

Dr. Watson makes a suggestion of "a combination between the poor-law and general hospitals." This is, in fact, partly embodied in a scheme sketched by Mr. Walter Spencer and myself in two articles that appeared in the *Times* of Jan. 10th and 11th upon which the editor of that paper in a leading article makes the comment "such a scheme seems to be peculiarly well suited to the existing state of affairs in the hospital world." The same leading article has the following summing up in support of the thesis I have been maintaining: "The voluntary hospitals have reached their present condition of efficiency as a result of prolonged effort and by way of countless trials and stresses. Most of them are the product of centuries of evolution. They embody great traditions and possess stores of experience of which all those who serve them become the inheritors. These traditions and this experience are treasures of inestimable worth. . . . Such a hospital service as this country possesses could not be reproduced by any conceivable effort of public authorities or expenditure of public money."—I am, Sir, yours faithfully,

E. GRAHAM LITTLE.

Wimpole-street, W., Jan. 14th, 1928.

NOMENCLATURE OF DISEASE.

To the Editor of THE LANCET.

SIR,—In an annotation in your issue of Dec. 24th, 1927 (p. 1355) an important suggestion appears to the effect that an attempt should be made by an authoritative committee to define names of disease and other medical terms in everyday use. I advocated this several years ago when writing of "tuberculous pus," after an inquiry from various authorities had revealed a widely differing conception as to what was meant by the word "pus." Like sciatica, rheumatism, and many other terms "pus" is a word hallowed by time, dating from a period when pathological conceptions were inexact, and for that reason its meaning still remains inexact. It should not be difficult to form such a nomenclature committee, not from one medical body, but from those mainly concerned, on the lines perhaps of the Joint Tuberculosis Council and similar organisations. It only needs someone to take the initiative. I am, Sir, yours faithfully,

Paignton, Jan. 5th, 1928. E. WARD.

GASTRO-DUODENAL ULCERATION.

To the Editor of THE LANCET.

SIR,—The letters of Dr. Ryle and of Drs. Izod Bennett and Moncrieff in your issue of Jan. 14th afford a welcome confirmation of the valuable effects of intensive alkaline treatment. These authorities, however, seem to have mistaken to some extent the purpose and scope of our article. Alkalis and basic products have been used at some time or other by several generations of medical men and often in intense doses. Since Kussmaul and Fleixner in 1893 introduced the use of large doses of bismuth compounds amounting to 20 g. or more per day, the literature contains many claims as to the efficacy of this treatment. The method is still successfully used on the continent, and, in our opinion, the good results undoubtedly obtained in many cases depend on the action of the massive dose of bismuth on the gastric secretion. In America Sippy's excellent work further extended this use of basic substances, but no single man can claim to have introduced the method. For years past the use of large doses of alkali has been so definitely recognised as a general principle by many experts on gastric work that we felt that the time to point this out was long past. Our article in no way claimed any originality for the use of alkali in large or small doses for the treatment of stomach diseases. Such a claim at this time of day would be absurd. We do claim to have presented some definite evidence that the *majority of uncomplicated gastric and duodenal ulcers can be treated successfully by giving sufficient alkali to control the injurious effects of the gastric secretion.* This is not generally known, at least in this country. The article was meant for the general practitioner and not for the expert. Its purpose was to help the medical man who is often sorely perplexed to know what to do in these cases.

Dr. Ryle objects to the "assumption" that the ulcer is "cured." Well, we need not quarrel about terms. If a patient who has suffered agonies for several years obtains complete relief which lasts for four or five years, and perhaps indefinitely, and if at the same time radiograms show that his ulcer had healed and still remains healed, then may we not term the result a cure? One of us was unfortunate enough to suffer from a duodenal ulcer from 1908 to 1914. Diet and other methods of treatment proved unsatisfactory and the condition became almost unbearable. In 1914 the use of excessive doses of sodium bicarbonate and bismuth carbonate taken for several weeks gave entire relief from symptoms. This good result has continued, and with the exception of a few comparatively mild attacks of discomfort during 1915, which were quickly relieved by alkali, no symptoms of any importance have been present since that time. Are we not justified in calling this a cure? It is generally acknowledged that there is a special tendency or "diathesis" in the constitution of the subject who develops gastric ulceration, but our experience points to the conclusion that the judicious and timely use of alkali in sufficient dosage will prevent recurrences in the majority of patients. If an ulcer of the leg disappears may we not say that it is *cured* even if at some future time an ulcer appears on the other leg? We do not say that alkali will cure the *tendency* to gastric ulceration. We think that we are justified in claiming that many stomach ulcers are cured, but we do not wish in any way to press the point as long as our meaning is clearly understood.

The second "assumption" to which Dr. Ryle objects is our statement that the effects of the treatment are to be attributed to the alkali. We have tried the usual dietetic and other methods of treatment, and in our hands the results obtained are not to be compared with those following the use of alkali. Though the point is difficult, or perhaps impossible, to prove, yet all the available evidence points to the use of alkali as the most effective means at our disposal for the healing of ulcers. Many patients who had been receiving various kinds of treatment for years without much success have yielded to the intensive alkaline method in a few weeks. Dr. Ryle's statement on pyloric stenosis is not in accord with our experience.

Another "assumption" we have made is to the effect that acidity can be easily controlled by alkali in the majority of cases. On this point we possess ample evidence which we hope to publish later. We do not claim that it is always easy to control acidity, but that it is by no means difficult to do so to a sufficient extent in the average patient. Dr. Ryle thinks it important that in matters of this kind our conclusions should be based on sound and well-weighed evidence. We claim that our evidence is both sound and well weighed. Our conclusions are based on our experimental results and we have taken the greatest care to ensure that these results are reliable. We agree that results and findings may sometimes be difficult to interpret, and in such cases we are reduced to formulating what appears to be the most probable explanation. We do not really feel that Dr. Ryle's friendly criticism has any bearing on our statements.

With regard to the remarks of Drs. Bennett and Moncrieff we agree that there is ample evidence in the literature that ulcers are sometimes healed under all sorts of treatment—sometimes, indeed, in spite of treatment. There is little doubt that many patients must be the victims of acute ulceration without experiencing any symptoms whatever, and it is equally certain that these acute ulcers tend to heal very rapidly. We also agree as to the importance of attending to septic foci, such as infected teeth, but unless we are misinformed with regard to the general attitude of the profession on this subject there is at present little risk of the teeth, septic or otherwise, being overlooked. No doubt judicious spacing of diet is useful, and, while no one doubts that much can be done by diet, the present unsatisfactory position of the treatment of ulcer proves that something more is required.

As already stated, the main purpose of our article was to help the general practitioner, and to point out that by means of an exceedingly simple method he can treat with success the great majority of the usual cases of gastric and duodenal ulcer. The chief part of the article contains the evidence for this claim and was presented in the radiograms. The comparatively short text was given to explain the reason for the treatment and was meant as a simple practical exposition of a successful method. In such an article, which must not be considered as a general scientific discussion of the subject, no references are required. In a future article we hope to deal with the subject more fully when all the pertinent references will be given.

Finally, we would emphasise the statement made in our paper that the method has been in use by us for about five years, and that it was only after an experience extending over this period that we thought it advisable to make it more widely known. We possess radiograms showing quite definitely that patients treated four or five years ago still show no evidence whatever of any return of the ulceration. In the face of the very definite statement to this effect made in our paper it is misleading to say that our experience only extends over a year or so. Our experience goes back for over ten years in the case of a few patients, and for four to five years in the case of a fairly large number of patients.

We would like to point out that it may be advisable in some patients to give the alkali three times a day for several months after the ulcer symptoms have passed over; also, after an operation for ulcer, it is, in our opinion, advisable to give some alkaline treatment for a considerable time.

We are, Sir, yours faithfully,

HUGH MACLEAN,
ISAAC JONES,
GEOFFREY FILDES.

St. Thomas's Hospital, S.E.,
Jan. 17th, 1928.

HYDNOCARPATES AND IODIDES IN LEPROSY.

To the Editor of THE LANCET.

SIR,—I have read with great interest Sir Leonard Rogers's article on the curative action of hydnocarpates and iodides in leprosy, published in your issue of Jan. 14th. The fact that, according to Sir Leonard Rogers, alepol has no irritating effect on the veins certainly gives it an advantage over other preparations. However, it is impossible to assert its superiority in therapeutic action, as its discovery is so recent that no definite statistics can be obtained until tests covering a considerable number of years have been made. In my opinion the lepricide action of sodium hydnocarpate is of little value. Many preparations such as turpentine, salicylate, antimony, &c., if administered in adequate quantities at the vital moment produce entirely similar reactions. I consider the use of iodides to be extremely dangerous and have myself seen a patient apparently cured relapse under their action.

In his Croonian lectures of 1924 Sir Leonard Rogers declared with similar enthusiasm that chaulmoogra oils and its derivatives would cause the total elimination of leprosy from the earth in a relatively short time. Many leprologists who expected great things on the strength of this statement were so disappointed by the results obtained that they have ended by mistrusting this method of treating leprosy. Notwithstanding the undoubted advances that have been made in the treatment of this deceptive disease during the last ten years, my experience has led me to the conclusion that there is no remedy entitled to be called "specific." I believe that the future treatment lies in the use of specific vaccines which unfortunately cannot at present be prepared from artificial cultures.

I am, Sir, yours faithfully,

JAMES HASSON, M.D.

Cleveland-square, W., Jan. 14th, 1928.

GONORRHŒAL URETHRITIS IN MALE CHILDREN.

To the Editor of THE LANCET.

SIR,—Writing in THE LANCET of Sept. 24th, 1927, Mr. B. Buckley Sharp finds that this condition is of rare occurrence. Here in Bombay, unfortunately, it is fairly common, and during my experience of two years at the J. J. Hospital, Bombay, I have seen about 30 cases of gonorrhœal urethritis in boys under 12. I agree that it is only on rare occasions that infection spreads beyond the anterior urethra, but I have seen a boy aged 8½ who had gonorrhœal arthritis with the prostate and vesicles definitely enlarged and tender. In another case, a boy aged 11, there was marked left epididymitis which subsided under appropriate treatment within eight days.

I am, Sir, yours faithfully,

K. TURNER,

Hon. Assistant Surgeon (Venereal Department).

Dec. 27th, 1927. J. J. Hospital, Bombay.

FACIAL LUPUS.

To the Editor of THE LANCET.

SIR,—In your issue of Nov. 26th, 1927 (p. 1118), appeared a very interesting account of light treatment in the London Hospital by Dr. Sequeira and Dr. O'Donovan. In their experience one type of facial lupus has proved extremely resistant to treatment. In their own words: "The most unfavourable type is that in which there is great thickening of the whole skin. When the face is involved the lips and cheeks become bloated and purplish-red in colour with a form of lymphatic infiltration resembling a pseudo-elephantiasis. Such cases are not common, but I have followed several from their early stages and have found nothing influence them." And "there is also a small percentage of cases that we cannot influence, particularly what may be called the 'facial lymphatic' type. Light baths have little or no effect." One such case has recently been treated at Leysin by Dr. A. Rollier, and I feel it may be of interest to mention that definite improvement was obtained by general sun and air cure. The case was recently presented to the Royal Society of Medicine by Dr. H. C. Semon, who has contributed an account of it, with illustrative photographs, to the Society's *Proceedings* (1927, xxi., 185).

I am, Sir, yours faithfully,

Leysin, Dec. 1st, 1927. T. W. T. DILLON.

NERVOUS INSTABILITY AND THE INTAKE OF SUGAR.

To the Editor of THE LANCET.

SIR,—May I suggest that the relationship between sugar consumption and many of those various nervous states grouped somewhat loosely as "neurasthenic" would warrant careful investigation? I believe it to be true that the consumption of sugar per head has increased by roughly twenty times during the last 60 years. Cases of nervous instability become more prevalent. That some endocrine disturbance occurs in many is a growing conviction. It seems possible that excessive intake of sugar is largely responsible for such disorder. To obtain proof from feeding experiments upon animals is difficult, because subjective symptoms similar to the early hypersensitive manifestations which occur in civilised man are not easy to follow in animals. Conclusions drawn from clinical observations may have far-reaching results.

I am, Sir, yours faithfully,

London, Jan. 9th, 1928. MACPHERSON LAWRIE.

AN OPERATION FOR THE ALLEVIATION OF DEAFNESS.

To the Editor of THE LANCET.

SIR,—I have read with interest the account given by Major Nesfield of his operation in your issue of Dec. 24th, 1927, as well as the ensuing correspondence, a part of which seems to deal rather with a wish to prevent possible infringement of copyright of another operation designed for a different purpose. Dr. William Hill strikes a necessary warning note as to the failure of former suggestions, and rightly stresses the necessity for careful investigation of results of the new method. It should, however, be borne in mind that, because earlier operations have failed in their object, there is no reason why later ones, carefully designed, should not be successful. The idea of the Nesfield method seems to be based upon rational lines, but there would appear to be a possible danger of its practice falling into inexperienced hands and faulty technique and after-treatment resulting in failure and possible disaster from suppuration or other untoward results. Another danger lies in the possible indiscriminate application of the method and its employment in cases where other and less drastic treatment would suffice. It is only fair to note that Major Nesfield, in his reply to criticism, issues a warning against this latter danger. I call to mind, however, a case which came into my hands some 12 or 13 years ago. It was suggested by a competent otologist to a lady suffering with a blocked Eustachian tube on one side that she should submit to a mastoid operation for the purpose of dilating the tube from the tympanum because it was impossible to introduce a Eustachian catheter. Naturally she demurred. The correction of a very marked deviation of the nasal septum resulted in making the passage of the catheter perfectly easy, and subsequent treatment restored her hearing.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Wimpole-street, W., Jan. 15th, 1928.

To the Editor of THE LANCET.

SIR,—The view taken by skilled otologists of this operation is clearly shown and, if I may say so, very nicely put, in your correspondence column of last

week. It would be easy, but is hardly necessary, to add to the technical objections there made. Whenever any alleged new remedy for anything is promulgated (particularly when as in this case it gets into the lay press), what is likely to be the natural effect upon the public? For one thing, premature if not quite baseless hopes are raised. Since the publication of this new cure for deafness in "ears healthy except for deafness," I, as doubtless all your correspondents, have been bombarded with questions: Is it any good? Do you recommend it? Will you do it? and so forth. This public aspect of the matter has not so far been mentioned and is clearly a very important aspect. I join with the others in calling for further information and in the meantime shall continue to be guided by experiences which are precisely the same as those of your recent correspondents, so far as alleviation or cure of deafness by a fistula is concerned.

I am, Sir, yours faithfully,

T. JEFFERSON FAULDER.

London, W., Jan. 16th, 1928.

To the Editor of THE LANCET.

SIR,—I am loath to condemn Major Nesfield's suggested operation for the alleviation of deafness, but having contended with Eustachian tubes and middle ears for 40 years is the excuse for my making these remarks. If his cases of deafness were only caused by Eustachian stenosis why make a false passage to ventilate the middle ear, instead of opening the tube? In every case of deafness it is essential to make sure the tube is functioning properly; if it is not, to make it do so. The action of the tube with its accompanying muscles is of a very complex nature, and no false passage directly communicating with the atmosphere can take its place. As so many forms of deafness exist—the conditions of the tube and surrounding tissues all varying in character—it would be interesting to know what class of case Major Nesfield proposes to attack. It would be necessary also to know how the condition of the tubes was examined. These are only a few of the points I would like to remark on. I am, Sir, yours faithfully,

CLAUD WOAKES.

Park-square West, N.W., Jan. 17th, 1928.

FATALITY-RATES OF SMALL-POX IN THE VACCINATED AND UNVACCINATED.

To the Editor of THE LANCET.

SIR,—Dr. Garrow's inquiry *re* the above is very easily answered.

It is generally known that the immunity conferred by vaccination lasts for a limited time only. The period is variously estimated as between 10 and 13 years. By selecting cases over 15 Dr. Garrow is careful to include all cases vaccinated in infancy, but no longer protected. His statement that "the fatality-rate among vaccinated cases was just five times as great as among unvaccinated cases" is therefore grossly misleading.

It is, in my opinion, most regrettable that a medical man occupying a responsible position should broadcast in the medical press such an assertion which he must be aware will be quoted on his authority and without context by the antivaccinist press. This kind of action can do nothing but handicap his colleagues, who are engaged in combating the present epidemic of small-pox with its serious burden on the public funds, the loss of wages involved, and the damage to industry, quite apart from the detriment to public health, which in my recent experience is becoming more serious as the infection is passed through the human medium.

I am, Sir, yours faithfully,

FRED. E. WYNNE,

Jan. 16th, 1928. Medical Officer of Health, Sheffield.

ORAL ADMINISTRATION OF INSULIN.

To the Editor of THE LANCET.

SIR,—In the leading article on the Treatment of Diabetes in THE LANCET of Sept. 3rd, 1927, it is said that: "Attempts to secure a form of insulin which acts after oral administration have so far proved ineffective . . ." This statement proves certainly true for the ordinary preparations of insulin and is also in perfect harmony with the general opinion among physicians—in England. In other countries, however, many a doctor has, for years already, become accustomed to the internal application of insulin and quite a number among them, diabetics themselves, are using insulin pills regularly ever since and are very satisfied with the result. Several hundreds of reports, that have been graciously put at my disposal by colleagues thoroughly acquainted with the oral application of insulin, are unanimous about its antidiabetic as well as its roborant effect; within 8–10 days of such treatment the output of sugar with the urine diminishes gradually and remarkably, the average saving being 80 g. pro die, whereas the greatest amount observed till now has been as much as 270 g. pro die. The pain of thirst and other complaints disappear already during the first days of treatment, and as a rule the patient becomes fit again for work within the first fortnight. The patients, of course, have to observe a certain diet, but no change of diet is allowed after the beginning of the internal insulin treatment, so that any decrease of the glycosuria can only be attributed to the influence of the insulin itself.

As I am quite aware of the strange fact that, unlike in other sciences, in medicine ever so many genuine and authentic testimonials of colleagues carry but little weight with them in the opinion of other doctors, especially foreign ones, I should be delighted to enable any English colleague who wants to repeat the above-mentioned experiments to do so by putting at his disposal any amount of insulin pills. In putting the oral insulin on trial it must be remembered that its indications as well as its effects differ in several respects greatly from that of the injected insulin. Whoever would expect the insulin pills to act as quickly on the glycosuria, or as strongly on the glycæmia, as the injected insulin must necessarily become disappointed. The effect of the orally administered insulin on the glycæmia is, in fact, to be compared with that of the physiologically produced hormone of the pancreas: neither of them causes any leap of the concentration of the sugar in the blood, and both of them try to keep it at a certain level.

Regarding the indications of the oral application of insulin it is advisable to exclude two big categories of diabetics—those who ought to get injections of insulin and those who are able to observe always a diet that makes their glycosuria disappear. The remaining (medium) category of diabetics is not as unimportant as one might be inclined to think judging from hosp'tal observations only; in fact, it is numerous enough to allow a fair trial of the possibility of a successful oral treatment with insulin. To begin with it can do them no harm whatever, and, judging from the many cases that have been under permanent medical observation for two or three years, the progress of their disease will be checked, their glycosuria diminish, their complaints disappear, and their efficiency for work be restored—a result that seems to be quite important enough, if not for the specialist, certainly for the general practitioner and his clients.

The insulin used in all the experiments mentioned above and partly published in foreign medical journals is, as already pointed out, not the usual one, but a specially concentrated one with the addition of purified ox-bile, that according to Besredka facilitates the intestinal resorption, and according to Landois checks the destroying influence of the trypsin on the

insulin. The antidiabetic effect of one of these insulin pills corresponds to four international units of insulin. I am, Sir, yours faithfully,

Saarbruecken. F. W. FORNET, M.D.

*** Dr. Fornet encloses extracts from German medical journals published during the last twelve-month and dealing with the results of insulin taken by the mouth. Apparently no determinations were made of blood-sugar, and it seems to have been a mild form of diabetes with which the several clinicians were dealing. In this country we are well aware that the mild forms of diabetes are readily influenced by changes in diet which it is difficult entirely to rule out. The work of Harrison, Lawrence, and Graham showed that no effect was produced on the blood-sugar by administering raw pancreas by the mouth when the diet was under perfect control. If it is admitted that insulin may have some effect on blood-sugar in rabbits and dogs when given by mouth with saponin, it seems that in the human subject the dose of saponin has to be relatively larger to produce any result at all, and even then the results are very variable.—ED. L.

THE TREATMENT OF THE MALARIAS.

To the Editor of THE LANCET.

SIR,—The introduction of any new drug of potential value in the treatment of malaria is an event of the first importance in tropical medicine, so it is very natural that it will be subjected to a considerable amount of criticism and claims of its efficacy regarded with scepticism. This is only as it should be. A study of the history of specific drugs reveals much the same sequence of events. The initial results are too often painted couleur-de-rose and therapeutic doses exhibited too large. This was so in the case of quinine itself, more recently in that of salvarsan and carbon tetrachloride.

A perusal of your leading article of Jan. 14th (p. 87) has led me to make some observations in order to remove misapprehensions. The writer of that article, though well versed in the literature of the subject, has obviously had no first-hand experience of plasmochin (or plasmoquine) in the treatment of malaria. As I pointed out in my original paper,[1] "The action of Plasmochin in Malaria," the initial doses of the drug as advocated by Mühlens were too large, thereby predisposing to symptoms of intoxication, especially in the subtertian form of malaria. There can be no doubt, however, from the observations of other workers as well as my own that this drug exerts a specific action on the gametocytes of the benign as well as of the subtertian forms. In an acute disease such as the latter form of malaria it is very difficult indeed to be certain whether alarming symptoms which may develop are due to the parasite itself or to the drug. It is a familiar experience that the same difficulty is encountered with quinine, but when plasmochin is combined with small doses of quinine (i.e., plasmochin-compound) the toxic effects of the former are counteracted and, in my experience, no untoward symptoms are encountered. This I have stated emphatically in my paper in THE LANCET of Jan. 7th (p. 25). The series of cases quoted there is comparatively small, but I have exhibited the drug to some 100 other individuals in whom, for one reason or other, no detailed records could be kept. In no instance have I encountered genuine intolerance and most certainly I have not seen any fatal or alarming symptoms, nor have I heard of such. In any new departure such as this these exaggerated statements are bound to be made. In addition to removing or neutralising the toxic element plasmochin-compound has the same startling effect upon the gametocytes, especially on the crescents of subtertian malaria, and it is (probably from the contained quinine) much more effective in acute subtertian cases with numerous ring forms (or schizonts) in which parasitic relapses used to occur on the pure plasmochin treatment. In no case which I have had under observation have the crescents recurred in the peripheral blood after their primary disappearance, and my records have been very carefully kept. It is true that plasmochin-compound has been issued in two forms. The first was purely experimental; the larger tablets each contained 0·01 g. plasmochin and 0·125 g. quinine sulphate. The second now on the market contains half that amount—i.e., 0·005 g. plasmochin and 0·0625 g. quinine sulphate. Your reviewer is clearly in error on this point, as he has quoted figures twice this size, and his statement on this point needs correction. The daily dosage I would advocate as the result of my recent investigations is one of 0·06 g. plasmochin plus 0·75 g. quinine sulphate (i.e., gr. 9¼ or twelve of the plasmochin-compound tablets). Every clinician experienced in tropical medicine is agreed that the latter dose of *uncombined* quinine is too small to control a bad attack of malaria and is certainly inoperative upon the crescent form.

Whatever the value of conflicting testimony may be, it is abundantly clear that a new specific has been introduced into our armamentarium quâ malaria. More extensive experience on its use will no doubt modify the dosage, and it is too early yet to say how far-reaching the importance of this discovery may be, but for those who are dissatisfied with the shortcomings of pure quinine (and their name is legion) the introduction of plasmochin is a step in the right direction. I am, Sir, yours faithfully,

PHILIP MANSON-BAHR, M.D., F.R.C.P.,
Physician to the Hospital for Tropical Diseases,
Jan. 17th, 1928. London.

[1] Proc. Roy. Soc. Med., 1927, xx., 919.

To the Editor of THE LANCET.

SIR,—Perhaps one reason why there is a shortage of quinine is that, being regarded as a "cure" for malaria, it is prescribed in large and continuous doses which involve much waste of the drug and many examples of cinchonism. As treatment quinine is, of course, invaluable, but the cure of malaria depends on the ultimate development of sufficient immune bodies to control the plasmodium in all its forms. I suggest that grs. 20 is an ample maximum daily dose, and that, when after four days the patient has lost his fever and is convalescent, he should be allowed a rest from quinine in order that all traces of the drug may be excreted and, in order that his own defence forces may have an opportunity of taking part in the fight for the patient's complete restoration to health, the administration of quinine being continued on these lines for a sufficient period but with a gradual decrease in the days of taking and an increase in the days of rest from quinine.

Put shortly, I urge that quinine should be given intermittently for the following reasons: (1) Cinchonism in its many forms is mostly avoided; (2) as a result of (1) patients continue their treatment; (3) there is a great saving—amounting to nearly 50 per cent.—in the amount of quinine used; (4) the case-results are very satisfactory.

I am, Sir, yours faithfully,

London, Jan. 17th, 1928. V. S. HODSON.

RECURRENT COLDS.

To the Editor of THE LANCET.

SIR,—Some of your recent correspondents on the above subject have spoilt a good case by overstatement. "Cold-catching" seldom troubles those who live in a well-managed open-air sanatorium; but they do not find it necessary to dispense with underclothing, excepting in very hot weather. Three points are of importance: training to react against chill; avoidance of excessive infection from without; and the removal of infective foci within the body. Such training should be carried out with due regard

to the individual reactive capacity at the time; we cannot all, or in all states of health, bathe with impunity in the ice-covered Serpentine. Overheated, underventilated places, and those with an unvarying temperature, are risky for most people. To avoid outside infection much greater care should be taken in removing household dust than is usual in most homes, preferably by wet cleaning. But the greatest protection is an open-air life, with a little common sense.

I am, Sir, yours faithfully,

Farnham, Jan. 16th, 1928. F. R. WALTERS.

Obituary.

FREDERICK GORDON BROWN, M.R.C.S., L.S.A.

THE death is announced at the advanced age of 85 of Dr. Frederick Gordon Brown, who practised in the City of London for many years and who died at Tailours, Chigwell, Essex, on Sunday last, Jan. 15th. The son of a doctor who practised in Wormwood-street, E.C., Gordon Brown was born in the City, and educated at Merchant Taylor's School. He received his medical education at St. Thomas's Hospital, where he held resident appointments after qualification in 1863. He then attended post-graduate courses in Paris before entering upon practice. He soon won for himself a good position, and for 52 years was a medical officer of the City of London Union and for over 28 years surgeon to the City of London police. He was also formerly surgeon to the Royal Hospital, Bridewell, and the Guildhall School of Music, so that his associations with the City were many and intimate. He was for many years in partnership in Finsbury-circus with Dr. A. P. Gibbons, and although he retired in September, 1914, he acted for various younger men during the war in order to release them for war service. He was at the time of his death the Senior Past Master of the Society of Apothecaries, and a past president of the Hunterian Society. He was also a prominent Freemason, being a Past Grand Officer of the Grand Lodge of England.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. J. R. Muir is placed on the Retd. List with rank of Surg. Rear Admiral.

To be Surg. Lts.: J. A. K. FitzGerald, J. W. Nesbitt, A. D. Sinclair, E. R. P. Williams, and A. E. Kingston.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. D. S. Skelton from the secd. list is restd. to the estabt.

Capt. J. H. Bayley to be Maj.

Lt. W. D. Speedy resigns his commn.

ARMY DENTAL CORPS.

Lt. D. C. Blyth to be Capt.

Temp. Lt. A. Brazenor, Dental Surg., Gen. List, to be Lt.

TERRITORIAL ARMY.

Maj. J. Wallace, from T.A. Res. of Off., to be Maj.

Capt. W. W. Brown, late R.A.M.C. (Spec. Res.), to be Capt.

Capt. (Prov.) R. N. Craig is confirmed in his rank.

Lts. A. C. Crawford, D. R. Owen, and C. E. W. Bower to be Capts.

Lt. R. Walkingshaw resigns his commn.

C. C. Ryan to be Lt.

Supernumerary for service with O.T.C.: Capt. J. F. Smith resigns his commn.

ROYAL AIR FORCE.

Flying Officers promoted to the rank of Flight Lt.: L. I. Hyder and J. Magner.

Flight Lt. F. K. Wilson is transferred to the Reserve, Class D.II.

Flight Lt. (Hon. Squadron Leader) E. F. N. Currey relinquishes his temporary commission on completion of service.

Flying Officer F. S. S. Whiter is promoted to the rank of Flight Lt. (Dental) on promotion to Captain in the Army Dental Corps.

AUXILIARY AIR FORCE.

No. 601 County of London (Bombing) Squadron: Pilot Officer E. D. W. Reid to be Flying Officer.

INDIAN MEDICAL SERVICE.

Lt.-Cols. J. D. Graham, M. MacKelvie, and W. H. C. Forster to be Cols.

Lt. J. H. Clapp to be Capt. (Prov.).

Lt.-Col. T. S. Novis retires.

DEATHS IN THE SERVICES.

Lieut.-Colonel Paxton St. Clair More, O.B.E., late I.M.S., who died at Bournemouth on Jan. 8th, aged 61, graduated in medicine and surgery at Edinburgh University in 1891, where he was for a time assistant demonstrator of practical physiology and pathology. He entered the Indian Medical Service and was at the Relief of Chitral in 1895. He also served in Iraq, and in 1920 was mentioned in dispatches and was awarded the O.B.E.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council held on Jan. 12th Sir Berkeley Moynihan, the President, in the chair, diplomas of Membership were granted to the following:—

Eleanor M. Carless, Royal Free Hosp.; Abani Mohan Chaudhuri, Calcutta and St. Bart.'s; Thomas E. Lamech, Cambridge and St. Thomas's; Mary M. Moller and Lois J. Ogle, Royal Free Hosp.; and Pattiyapotheranneheiage Paul Peries, Ceylon and King's College.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—The Morison lecture will be delivered at the College on Wednesday, Jan. 25th, by Dr. George M. Robertson. His subject will be the Teaching of Psychiatry in Edinburgh and Sir Alexander Morison.

UNIVERSITY OF SHEFFIELD.—At examinations held recently in the Faculty of Medicine, the following candidates were successful:—

M.D.—Marion Hirst.

Final M.B., Ch.B. Examination.—Part II.: Humphrey Brookes, Albert O. Flint, Patrick B. Lee-Potter, and Vernon E. A. Marwood. *Part I.:* William Alcock, Doris Butler, Dorothy Colver, Reginald D. Dewar, Traugott E. Gumpert, Kenneth J. G. Milne (with distinction in Public Health), Trevor K. Owen, Geoffrey B. Thomas, Walter A. Timperley, and Joan J. J. Wallace.

UNIVERSITY OF LIVERPOOL.—At a recent examination the following candidates were successful:—

DIPLOMA IN PUBLIC HEALTH.

V. H. Atkinson, Annie T. Deane, Sybil O. Edwards, and A. N. Malhotra.

PREVENTION OF INDUSTRIAL ACCIDENTS.—A conference on Accident Prevention is to be held under the auspices of the Industrial Welfare Society at the Hotel Metropole, Northumberland-avenue, London, on Friday, Jan. 27th. Details may be had from Mr. G. P. Holden at 151, Palace-street, S.W. 1.

The fifth International Medical Congress for Industrial Accidents and Occupational Diseases is to be held in Budapest from Sept. 2nd to 8th. The Executive Committee consists of Prof. Tibor de Verebély (President), Prof. William de Friedrich (vice-president), and Dr. George Gortvay (secretary general). Addresses will be given, amongst others, by Prof. J. Liniger, Dr. F. Zollinger, Prof. K. B. Lehmann, Sir Thomas Oliver, Prof. J. G. Sleeswijk, Prof. Jütten, Prof. Koelsch, Prof. Julius van der Hoeve, and Prof. Stephan Jellinek. Although industrial diseases will receive consideration, particular prominence will be given in the programme to industrial accidents, as in 1929 a congress specially devoted to diseases is to be held in Lyons under the auspices of the Congress for Occupational Diseases. The Council of Industrial Medicine has been nominated to act as the British National Committee, and further information can be had from the Secretary, 12, Stratford-place, London, W. 1.

UNIVERSITY OF LONDON: *University College.*—A course of six lectures on the Internal Secretions of the Gonads will be given by Mr. A. S. Parkes, D.Sc., on Mondays, Jan. 30th, Feb. 6th, 13th, 20th, and 27th, and March 5th, at 5 P.M. Admission will be free, without ticket.

UNIVERSITY OF MANCHESTER.—Prof. J. S. B. Stopford, F.R.S., has been appointed a Pro-Vice-Chancellor of the University.

RESEARCH ON THE COMMON COLD.—The sum of £39,000 has been given to Johns Hopkins University, Baltimore, to pay for research into the origin, nature, and possible cure of the common cold.

THE SUPPRESSION OF QUACKERY.—The California Medical Association has received under the will of the late Dr. Morris Herzstein a bequest of 20,000 dollars to be used in the suppression of quackery in the practice of medicine.

POST-GRADUATE STUDY IN BERLIN.—A programme of numerous courses of lectures to be held in March and April has now been issued by the Kaiserin Friedrich-Haus, Luisenplatz, 2–4, Berlin, N.W. 6. This organisation assists foreigners to secure suitable lodgings, and can also arrange visits to clinics and hospitals.

CENTRAL ASSOCIATION FOR MENTAL WELFARE.—A special ten weeks' course is being held in London from May 11th to July 19th for teachers of mentally defective and of dull and backward children. It is intended for those with no previous experience of the work. Since 1925 three similar courses have been arranged by the Association with the full approval of the Board of Education.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—A Festival Dinner will be held on Monday, Jan. 30th, at the Mansion House, London, by invitation of the Lord Mayor. Prince Henry will preside. An effort will be made to raise funds to pay off the debt of £40,000 created by extensions at the country branch at Stanmore.

AMALGAMATION OF WOLVERHAMPTON HOSPITALS.—It is proposed to amalgamate the Wolverhampton and Staffordshire Hospital and the Wolverhampton Hospital for Women, and the Hospital Saturday Committees of the two institutions have unanimously approved of the scheme on the ground that it will provide a more efficient service. The general hospital at present has 210 and the women's hospital 30 beds, but enlargements in progress at both institutions will increase the accommodation approximately to 300 beds.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Dr. W. A. Potts will lecture on Mental Defect and its Importance to the Community, on Monday, Jan. 23rd, at 5 P.M., at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square. On the same date, at 3 P.M., at the Royal Eye Hospital, Southwark, Mr. McCallan will give a clinical demonstration, and Mr. Mortimer Woolf a general surgical demonstration at 2 P.M., at the Queen Mary's Hospital, Stratford. On Thursday, Jan. 26th, at 1.30 P.M., Sir Thomas Horder will demonstrate at St. Bartholomew's Hospital. The lectures and demonstrations are open to members of the medical profession without fee. Six lecture-demonstrations on Psychological Medicine, held on Tuesdays and Saturdays at 11 A.M., at the Bethlem Royal Hospital, have still to be given. From Feb. 6th, for four weeks, a course in Venereal Diseases will be given at the London Lock Hospital, consisting of lectures and clinical instruction in the out-patient department. Early application should be made. From Jan. 30th to Feb. 25th a course will be held at the London School of Dermatology (St. John's Hospital); clinical instruction will be given in the out-patient department every day, and lectures on Tuesdays and Thursdays at 5 P.M. (practical pathological demonstrations can also be arranged). An all-day course in Diseases of Children will be given from Feb. 6th to 18th at the Paddington Green Hospital and at the Victoria Hospital for Children; sessions at the former hospital will be held on Feb. 7th, 8th, 10th, 13th, and 17th, and at the latter on Feb. 6th, 9th, 11th, 14th, 15th, and 18th. Early application is requested. From Feb. 20th to March 3rd, at the Queen Mary's Hospital, Stratford, an all-day course will be given in medicine, surgery, and the specialties. From Jan. 30th to March 23rd, at the National Hospital, Queen-square, a course will be held in neurology, anatomy, and physiology of the nervous system, and demonstrations will be given on methods of clinical diagnosis in diseases of the nervous system and in pathology. Information, syllabuses, tickets, and copies of the *Post-Graduate Medical Journal* may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

PRESENTATION TO A MEDICAL MAN.—Dr. Edward Fielden was recently presented with a cheque and an illuminated book containing the names of 1400 people who wished to show their appreciation of his services during more than 25 years of practice at Bracknell, in Berkshire.

LIVERPOOL HOSPITAL FOR DISEASES OF THE HEART. Miss Margaret Beavan, Lord Mayor of Liverpool, last week opened a new operating theatre and an additional ward to mark the second anniversary of the opening of the institution. The extension increases the number of beds to 32. The Lord Mayor was presented with a silver casket as a souvenir.

IMPORTATION OF SYNTHALIN.—The Board of Trade have given notice that representations have been made to them under Section 10 (5) of the Finance Act, 1926, regarding hydrocyanic acid and synthalin (Deka methylene diguanidine hydrochloride). This section provides that the Treasury may exempt from the duty imposed by the Safeguarding of Industries Act, 1921, any article which is not made in any part of His Majesty's Dominions in quantities which are substantial, having regard to its consumption for the time being in the United Kingdom, if there is no reasonable probability that it will within a reasonable period be made in His Majesty's Dominions in such quantities. Any person wishing to communicate with the Board about this application should write to the Principal Assistant Secretary, Industries and Manufactures Department, Board of Trade, Great George-street, S.W. 1, before Feb. 12th.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Jan. 23rd.—8 P.M., ODONTOLOGY. Paper: Mr. Arthur Bulleid: On Apical Infection; Casual communications: Mr. H. P. Baylis: Case of Necrosis of the Mandible. Mr. W. Rushton: An Abnormally Small Premolar.

TUESDAY.—5 P.M., MEDICINE. Discussion on Cardiac Infarction (Coronary Thrombosis). Openers: Dr. John Parkinson and Dr. D. Evan Bedford. Other Speakers: Dr. Carey Coombs, Dr. Geoffrey Hadfield, Dr. J. A. Ryle, and Dr. B. T. Parsons-Smith.

WEDNESDAY.—5 P.M. TROPICAL DISEASES, DERMATOLOGY, AND COMPARATIVE MEDICINE. Special Discussion on Cutaneous Mycoses in the Tropics. Openers: Mr. J. Ramsbottom (for the Section of Tropical Diseases), Dr. A. Whitfield (for the Section of Dermatology).

THURSDAY.—5 P.M., BALNEOLOGY. Paper: Dr. Adolph Schott (Bad Nauheim): Carbon Dioxide Thermo-Saline Springs in the Light of Modern Research. 8.30 P.M., UROLOGY. Clinical Pathological Evening.

FRIDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.) 8 P.M., EPIDEMIOLOGY. Paper: Dr. J. E. McCartney and Dr. Wm. C. Harvey: Some Observations on Diphtheria Carriers.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Jan. 23rd.—8.30 P.M., Discussion on Treatment of Pernicious Anæmia, to be introduced by Prof. F. R. Fraser, followed by Sir William Willcox and Dr. H. French.

MEDICO-LEGAL SOCIETY.

THURSDAY, Jan. 26th.—8.30 P.M. (at 11, Chandos-street, Cavendish-square, W.), Mr. F. Llewellyn-Jones: Drunkenness and Civil and Criminal Responsibility—A Study in Comparative Law.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.

FRIDAY, Jan. 27th.—8.30 P.M., General Meeting. Papers will be read by Colonel L. W. Harrison and Dr. D. N. Nabarro on the Antenatal Treatment of Venereal Disease—Syphilis. A discussion will follow.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.

FRIDAY, Jan. 27th.—4.15 P.M. (at St. John's Hospital, 49, Leicester-square, W.C.), Clinical Cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, Jan. 23rd, to SATURDAY Jan. 28th.—FELLOWSHIP OF MEDICINE Lecture at the Medical Society, 11, Chandos-street, W. Mon., Dr. W. A. Potts: Mental Defect and its Importance to the Community.—QUEEN MARY'S HOSPITAL, Stratford, E. Mon., 2 P.M.,

Mr. Mortimer Woolf: General Surgical Demonstration.—ROYAL EYE HOSPITAL, Southwark, S.E. Mon., 3 P.M., Clinical Demonstration by Mr. MacCallan. The above are free to members of the medical profession.—BETHLEM ROYAL HOSPITAL, St. George's Fields, S.E. Course in Psychological Medicine. Lecture-demonstrations Tues. and Sat., at 11 A.M.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, W.

MONDAY, Jan. 23rd.—10 A.M., Dr. Dowling: Skin Department. 11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Dr. Trevor Davies: Gynæcological Department.

TUESDAY.—2 P.M., Dr. Shaw: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Hamblen Thomas: Throat, Nose and Ear Department.

WEDNESDAY.—10 A.M., Dr. Burnford: Medical Wards. 2 P.M., Mr. Tyrrell Gray: Operations. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Mr. MacDonald: Genito-urinary Department. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Dr. Pritchard: Special Medical Treatment Clinic. 2 P.M., Mr. Vlasto: Throat, Nose and Ear Department. 4.30 P.M., Dr. Archer: Carbohydrate Tolerance Tests (lecture-demonstration).

SATURDAY.—10 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Owen: Medical Diseases of Children.

Medical and Surgical Out-patients, Operations, Special Departments, daily, 10 A.M. to 5 P.M., Saturdays, 10 A.M. to 1 P.M.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.

MONDAY, Jan. 23rd.—2.30 to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M., Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, Jan. 24th.—5 P.M., Dr. W. J. O'Donovan: Exfoliative Dermatitis.

THURSDAY.—5 P.M., Dr. Knowsley Sibley: Electrotherapeutics.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.

MONDAY, Jan. 23rd.—1.30 P.M., Mr. R. J. Cann: Examination of the Pharynx and Naso-pharynx.

WEDNESDAY.—1.30 P.M., Mr. N. Heskieth: Examination of the Nose.

FRIDAY.—4 P.M., Mr. H. Kisch: Multiple Nasal Sinusitis (1).

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, Jan. 24th.—3.15 P.M., Dr. C. C. Beatty: Indigestion.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, Jan. 26th.—4 P.M., Mr. Eric Lloyd: Rectal Prolapse in Childhood.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Jan. 25th.—4.30 P.M., Dr. G. Carter: Tests for Drunkenness, particularly in Relation to Motor Accidents.

ST. MARY'S HOSPITALS, MANCHESTER (Post-Graduate Lecture).

FRIDAY, Jan. 27th.—4.30 P.M. (at the Whitworth-street West Branch), Dr. Ward: Intestinal Indigestion in Children.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, Jan. 27th.—3.30 P.M., Mr. Ferguson: Eye Cases.

Appointments.

BOLTON, S., M.D., Ch.B. Edin., has been appointed Certifying Surgeon under the Factory and Workshop Acts for Halifax.

PAGE, HILDA W., L.R.C.P. Lond., M.R.C.S., a member of the Honorary Medical Staff of the Willesden General Hospital.

SOURASKY, A., M.B., Ch.B. Leeds, F.R.C.S., Assistant Ophthalmic Surgeon, London Jewish Hospital.

WHEELER, D. R., M.B., B.Ch., B.A.O. Belf., F.R.C.S. Eng. and Irel., Aural Surgeon to the Kent County Ophthalmic and Aural Hospital, Maidstone.

Vacancies.

For further information refer to the advertisement columns.

Birkenhead General Hospital.—Cas. H.S. £100.
Birmingham City.—Sen. Asst. M.O.H. £1100.
Blyth, Borough of.—M.O.H., &c. £800.
Brighton, Royal Sussex County Hospital.—Hon. Dental Surg.
Bristol, Southmead Hospital.—Second Asst. M.O. £200.
Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.
Cardiff Royal Infirmary.—H.S.'s and H.P.'s. Each at rate of £50.
Coventry, City of.—Deputy M.O. £750.
Coventry, Gulson-road Hospital, and Poor-law Institution, &c.—Res. M.O. £500.
Downham (L.C.C.) Treatment Centre.—Ophth. S. £80. Half day per week.
Durham, Earl's House Sanatorium for Boys.—M.O. £450.
Elizabeth Garrett Anderson Hospital.—Asst. Radiologist. £100. Also Asst. Pathologist. £150. Both part-time.
Evelina Hospital for Children, Southwark, S.E.—H.P. £120.
German Hospital, E.—Hon. Asst. Surg.
Highgate Hospital, Dartmouth Park Hill, N.—Jun. Asst. Med. Supt. £325.
Infants Hospital, Vincent-square, Westminster.—H.P. At rate of £75.
Leicester Royal Infirmary.—Cas. H.S. At rate of £125.
Liverpool, City of.—City Coroner. £1000.
London Female Lock Hospital, 283, Harrow-road, W.—2nd H.S. At rate of £150.
Manchester Royal Infirmary.—Asst. M.O. £35.
Metropolitan Hospital, Kingsland-road, E.—Ophth. S.
Norfolk, Administrative County of.—County M.O.H. £1200.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. Orthopædic Surg.
Oxford, Wingfield Orthopædic Hospital, Headlington.—Asst. S. £600.
Peckham House Mental Hospital, 112, Peckham-road, S.E.—Jun. Asst. M.O. £250.
Royal London Ophthalmic Hospital, City-road, E.C.—Clifford Edmonds Prize in Ophthalmology. £100.
Royal Naval Dental Service.—Five Dental Surgeons.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Non-res. Cas. O. £150.
St. Bartholomew's Hospital.—Asst. S.
St. John's Hospital, Lewisham.—Asst. P.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. M.O. and Asst. Res. M.O. At rate of £175 and £130 respectively.
Salford, City of.—Venereal Disease M.O. £750.
Shanghai Municipal Council Public Health Dept.—Asst. Radiologist. Taels 700 a month.
Sheffield Royal Hospital.—Res. Anæsthetist.
Shrewsbury, Royal Salop Infirmary.—H.P. £160.
Sleaford, Kesteven Mental Hospital.—Asst. M.O. £350.
Stoke-on-Trent City Maternity Home.—Res. M.O. £450. Also Consulting Officer. £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary, Hartshill.—Hon. Asst. S., Hon. Anæsthetist, Hon. Asst. Aural S., and Hon. Asst. Orthopædic S.
Truro, Royal Cornwall Infirmary.—H.S. £170.
West London Hospital, Hammersmith-road, W.—Hon. Obstet. S.
Windsor, King Edward VII. Hospital.—Hon. Asst. Phys.
Wolverhampton and Midland Counties Eye Infirmary.—H.S. £200.
Woolwich and District War Memorial Hospital, Shooters' Hill, S.E.—Radiographer.

The Secretary of State for the Home Department gives notice that he is considering the appointment of one or more Ophthalmic Specialist Medical Referees under the above Act for County Courts in Circuits 16 and 17, which comprise roughly the East Riding of Yorkshire and Lincolnshire. Applications should be addressed to the Private Secretary, Home Office, London, S.W. 1, and should reach him not later than Feb. 7th, 1928.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Islay (Argyllshire), Wallingford (Berkshire), Fyvie (Aberdeenshire), Portree (Inverness-shire), and at Wetheral (Cumberland).

Births, Marriages, and Deaths.

BIRTHS.

DOYLE.—On Jan. 10th, at Old Bromley-road, Bromley, the wife of Dr. J. L. C. Doyle, of a daughter.

PERRIN.—On Jan. 12th, at Upper Wimpole-street, W., the wife of W. S. Perrin, F.R.C.S., of a daughter.

THOMAS.—On Jan. 11th, at Ashley-gardens, S.W., the wife of C. Price Thomas, F.R.C.S., of a son.

DEATHS.

BROWN.—On Jan. 15th, at Tailours, Chigwell, F. Gordon Brown, M.R.C.S., late surgeon of the City of London Police, Past-Master of the Society of Apothecaries, aged 85. Funeral at Chigwell to-day (Friday) at 3.15 P.M.

DINNIS.—On Jan. 15th, at Leigh Croft, Hoddesdon, Alfred Dinnis, M.R.C.S., L.R.C.P., L.D.S., aged 47.

MORE.—On Jan. 8th, Lieut.-Col. St. Clair More, O.B.E., I.M.S., at Bournemouth, aged 61.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

PALÆOPATHOLOGY AND EVOLUTION.*

By J. C. M. GIVEN, M.D., M.R.C.P. LOND., F.G.S.

THE great interest that has been taken of recent years in the history of medicine has resulted in much research and in the classification and publication of many important facts, all of which, however, are more or less confined to the historic period of which written records are available. The allied subject of the antiquity of disease is much more difficult to explore, as the chief evidence consists of the fossil remains, usually fragmentary, of a long-departed fauna.

Yet the more such evidence is collected and sifted the more it shows that disease in its protean manifestations has been a powerful agent in the elimination of the unfit, and the survival and persistence of the predominating types of life in the evolutionary struggle, and that insufficient credit has hitherto been given to this factor.

It is interesting to note that the most important causative agents of disease that we recognise to-day—namely, bacteria—were the earliest known forms of life. They probably prepared both the earth and the ocean for the further evolution of plants and animals. The fact that they did exist at this epoch was proved by Walcott [1] in 1915, when he found micrococci associated with very primitive algæ in the pre-Cambrian limestones of the Algonkian Mountains, the earliest sedimentary rocks of which the earth is built. This is only what we should expect when we consider the cyclical processes of life in the universe. All plant life depends on the nitrifying bacteria of the soil for the nitrates with which to build up its proteins; the plants are devoured by animals and new proteins are built up, and the completion of the cycle is only made possible by putrefactive organisms breaking down the nitrogenous animal tissues into free ammonia. The first lowly bacteria derived their energy and nutrition from inorganic chemical compounds such as the ammonia salts; they were, according to Osborn [2] the first step between the organic and the inorganic, and represent the survival of a primordial stage of life's chemistry. Survivors of these bacteria still persist in the nitrifying soil organisms just alluded to.

The early microbes first began a parasitic life by symbiotic relations with other bacteria; then they laid hold on the chlorophyllic carbon-storing plants, stealing carbon from the plant and nitrogen from the atmosphere, and thus started on the path which led from symbiosis to parasitism, and thence to that of pathogenic infective agents, though the last stage probably took long ages to reach.

Adami [3] points out that microbes do not form an order by themselves, but are singularly diverse in their affiliations. Whether bacteria or protozoa like the spirochætes, every pathogenic microbe has closely related forms or species, differing from them in little beyond the fact that one is virulent and that the other is not. This leads to the conclusion that all the pathogenic germs have originated in harmless saprophytes. The non-virulent diphtheroid organisms, the bane of the diagnostician, probably long preceded the Klebs-Löffler bacillus.

The Evolution of Pathogenic Bacteria.

The evolution of the various strains of these minute organisms results from changing environment, just as it does among the higher forms of life. The colon bacillus leads a harmless and probably a useful life in its native pastures of the large bowel, but when it migrates into the urinary tract it becomes endowed with very different characteristics. Similarly, in Devonian times, before our coal measures were laid down and when fishes were the sole representatives of the vertebrata, some of these, hankering after a change of scene, migrated to the land and became first amphibia, and later reptilia, which were the basal stock of the mammalia. The two processes are identical, though one, acting on a minute simple monocellular organism, may have only taken hours to bring about; the other, working on a complex vertebrate, required millions of years. This rather crude analogy may be pushed further. Bacteriologists tell us that the wandering bacilli may, by various cultural methods, be enticed back to dwell in similar surroundings to their old ones. In the same way some of the mammalia, probably in the African continent, got tired of their existence on dry land, and early in the Tertiary period reverted to a life in the ocean and became whales, dolphins, and porpoises, but retained indelible traces of their terrestrial life and mammalian origin, just as, probably, our colon bacillus is never quite the same again after first leaving the intestinal tract.

Bacteria do not seem to have taken on pathogenic qualities until forms of life had become numerous and varied, and their agency was not required for many millions of years as a factor in the process of natural selection. Fossils can afford little evidence of this kind, and when life was only represented by the polyzoa and the higher forms of the invertebrata, such as molluscs and arthropods, it is probable that traumatism, degenerative changes, and the consumption of each other as food would represent all the ills to which individuals were subject. By the time coal measures were formed bacteria seem to have established themselves as saprophytes on the fishes of that age, as Renault [4] has demonstrated them in coprolites, or fossil fæces, in the Autun coalfields of France. This is perhaps an instance of an early intestinal flora, the first appearance or prototype of the colon bacillus. Renault also figures a micrococcal type of organism in the lacunæ and canaliculi of the bones of fossil fishes in these coal measures. This is the earliest hint of the existence of pathogenic infection.

Fossil Pathology.

From the Permian strata of Texas Roy Moodie [5] describes a microscopic section of the fractured dorsal spine of a reptile, Dimetrodon, which he considers to be a case of infective osteomyelitis, showing osseous trabeculæ around large necrotic sinuses, once filled with pus and now replaced by calcite crystals. This is probably the earliest known instance of the presence of pathogenic bacteria, for the specimen must be at least 15 million years old. Another instance by the same author [6] from a slightly later period, the Cretaceous, when our chalk downs were being formed, shows necrotic changes in the radius of a large aquatic reptile with the formation of dense hypertrophic bone, the normal vascular spaces having been obliterated.

As an example of a simple uninfected fracture with normal union and a moderate degree of callus we may take the fractured radius of another reptilian Dimetrodon from the same Permian beds.[5] A further interesting specimen is a tumour in the caudal vertebra of a Diplodocus of Cretaceous age, described by Moodie as an hæmangioma. These enormous reptiles, nearly 70 ft. long and weighing approximately 40 tons, dragged their gigantic 30 ft. tails along the ground and must have been much subject to traumatism. Moodie also mentions a tumour of the jaw of a primitive horse, *Merychippus campestris*, of Miocene age, a lesion which was evidently of long-standing and which suggests actinomycotic infection.

The earliest known human skeleton has a pathological lesion; the femur of *Pithecanthropus erectus* of Java shows a large irregular outgrowth from the shaft, evidently of the nature of myositis ossificans. Though the geological horizon of the Rhodesian skull is uncertain, it is undoubtedly very ancient, and is of extreme Neanderthaloid type. There is a deep irregular sinus in the petrous portion of the left temporal bone just behind the external auditory meatus. Tracking upwards and slightly forwards from this is a shallow groove on the squamous portion, and just in front of the termination of the groove is a circular hole which goes right through the squama into the cranial cavity; the edges of this foramen are quite smooth, and it must have been made ante-mortem. Macleod Yearsley declared that these abnormalities were due to mastoid disease, and it is fairly obvious that the mastoid abscess opened behind the external auditory meatus and tracked upwards and forwards under the temporal muscle. There is a second bony sinus at the tip of the mastoid process, so that it must also have opened into the muscles of the neck. Some suppose that the circular smooth opening is a primitive piece of cranial surgery, to drain the abscess and perhaps a deeper temporo-sphenoidal one. Elliot Smith has suggested that the marks may have been caused by gnawing insects, such as cockroaches, which, he states, often attack the bones of Egyptian mummies; such an explanation, however, is not satisfactory here, and cannot possibly be applied to the smooth round hole in the squamous bone. Prehistoric cranial trephining is a large subject; it was a common practice among some neolithic peoples and among the ancient tribes of Peru. I would refer anyone interested in this matter to Dr. Wilson Parry's [8] instructive address to the Listerian Society of King's College Hospital, 1923. There is an excellent exhibit of ancient skulls with trephine holes in the Hunterian Museum of the Royal College of Surgeons of England, and alongside has been placed the skull of the first patient on which a successful operation for the removal of a cerebral tumour was done. It was performed by Sir Rickman Godlee in 1884, after being diagnosed and localised by Dr. Hughes Bennett.

Another well-known prehistoric skeleton showing pathological changes is the Chancelade skeleton [9] in the museum

* Being the presidential address to the Liverpool Medical Institution, delivered on Oct. 13th, 1927.

at Perigeaux, from the Magdalenian deposits in the Dordogne, probably about 10,000 years old. It shows an extensive fracture of the right temporal bone which has completely healed. It also shows well-marked evidence of osteo-arthritis in the shoulder-joints and dorsal spinal articulations.

The Work of Marc Ruffer.

The subject of prehistoric human pathology was first seriously investigated by Sir Marc Armand Ruffer, who coined the term palæopathology. He was the first director of the British Institute of Preventive Medicine. While investigating the new antidiphtheritic serum in 1891 he contracted the disease and suffered severely from paralytic sequelæ; giving up his post, he went to Egypt to convalesce, and settled there. He was the first to investigate the microscopic structure of mummies, and he invented special methods for cutting and staining this difficult material. After his death his papers and studies were edited and published in 1921 by R. L. Moodie, professor of anatomy at the Illinois University of Chicago, under the title of "Studies in the Palæopathology of Egypt." The preface is a mine of interesting facts. Ruffer was indebted for much of his material to Reisner, Elliot Smith, Wood-Jones, and Derry, who had been assisting in an archæological survey, which the Government of Egypt carried out in 1907, of that part of Nubia about to be submerged by the Assouan Dam. The report [18] drawn up by these gentlemen was published by the Egyptian Government in a series of bulletins containing much information on the pathology of the ancient population of that country. Some of the best specimens from this survey form an interesting exhibit in the Nubian collection of the Hunterian Museum, and are well worth inspection; they were shortly catalogued and described by Shattock, who on one occasion exhibited before the Royal Society of Medicine sections of the aorta of Meneptah, the reputed Pharaoh of the Hebrew Exodus, who died 1215 B.C.; the section showed typical senile calcification, the elastic lamellæ being perfectly preserved, and the interlamellar material thickly strewn with calcium phosphate.

One of the most interesting discoveries of Ruffer was the demonstration of typical calcified eggs of *Bilharzia hæmatobia* in the tubules of the kidney in two mummies of the XXth dynasty; the rectum and bladder, however, were not sufficiently preserved to show the condition. This form of schistosomiasis with which now, according to recent authorities, 60 per cent. of the inhabitants of Egypt are infected, was therefore present at least 1000 B.C.

One of the plates in this book shows an excellent example of Pott's disease of the spine, with a well-marked psoas abscess from the mummy of a priest of Ammon of the XXIst dynasty. Ruffer also figures a vesicular rash from the skin of a mummy of 1200 B.C. The distribution of the rash corresponds with that of small-pox, and the structure shows the dome-shaped vesicles in the prickle cell layers. The high-power photographs of the skin show a large number of bacilli stained Gram-eosin. These presumably were secondary, but this shows very well the preservation of these organisms for many centuries.

A statuette, now in Cairo Museum, of an important court official, "head of the wardrobe," who lived in the Vth dynasty, 2700 B.C., is a typical achondroplastic dwarf with the usual disproportion between the trunk and limbs. These dwarfs seem to have been fairly common in ancient Egypt; several are figured on the monuments. The *Times* of April 7th, 1927, describes the effigy of an individual called Senab, 2000 B.C., recently discovered in a Mastaba tomb, which, from the description, was another example of achondroplasia. Pigmies from Central Africa were also employed by the ancient Egyptians, and any fantastic or abnormal dwarf was evidently highly prized for household service. Rickets and talipes are among the varieties figured. Osteitis deformans, or osteo-arthritis, occurred widely among the early Egyptians; this is emphasised by Elliot Smith and Wood-Jones in the Nubian Survey Report.[18] It seems to have affected especially the spinal column. There is a well-marked example (Flinders Petrie) of the spondylitic variety in an individual of the name of Nefermat, in whom the whole spinal column, from the fourth cervical vertebra to the coccyx, has been converted by the disease into a rigid column; it has subsequently been broken into several pieces. It was found in one of the early Mastaba tombs of the IIIrd dynasty about 3200 B.C., long before the age of the Pyramid builders.

From the catacombs of Alexandria, in the time of the Roman occupation, A.D. 250, Ruffer obtained an interesting specimen of pelvic tumour. The ischium was greatly thickened and rounded and, on section, consisted of compact dense bone with numerous cavities. He says it is clearly not due to any of the infective agents, such as tubercle or syphilis. He considers it to be an osteosarcoma, of which we have only the bony remains left.

We may take it that there never was a time when mankind was not cursed by toothache. Dental caries is found in the early and late Stone Ages and was very common in the Bronze Age in Europe. Ruffer figures many cases from early dynastic times in Egypt.

Syphilis.

It is an interesting fact that no evidence of syphilis has been found amongst ancient Egyptian remains, and the origin of this disease is still shrouded in mystery.[10] At a special discussion on syphilis at the Royal Society of Medicine in 1912 [11] Norman Moore pointed out that the disease could not have been recognised in Roman times, for that keen observer Galen, with his careful descriptions of nervous disease, is quite silent as to the characteristics of locomotor ataxy or general paralysis of the insane. On the other hand, Voberg, of Stuttgart,[12] recognised the stigmata of the disease in certain early historical personages, such as Augustus Cæsar and Socrates. All the busts of the great philosopher show a marked retroussé nose with a defective bridge. The statuette recently discovered in Alexandria, dating from the fourth century B.C., is the earliest known representation of the sage, and must have been almost contemporaneous; it may, indeed, have been made from life. It has just been acquired by the British Museum [20] and demonstrates the condition very clearly.

Some have tried to find evidence of lues in the descriptions of disease in Holy Writ, such as the Emerods with which the Philistines were afflicted in their secret parts (I. Samuel, V. and VI.), but Adami [3] in his Croonian lectures attributes these lesions, and no doubt rightly, to bubonic plague.

It has generally been supposed that syphilis was not recognised in Europe until after the return of the sailors of Christopher Columbus from the discovery of America in 1493, the inference being that they brought it from that country. The well-known American anthropologist, Hrdlicka, of Washington,[19] on the other hand, in his extensive studies of hundreds of pre-Columbian skeletons in that country, states that he has never come across any condition suggestive of syphilis, while skeletons of American Indians of post-Columbian date show that the disease wrought fearful havoc amongst them. But this year Prof. Hayhurst,[13] of Ohio University, quotes the radiographic work of Dr. Means on the skeletons of the Mound builders of Ohio. These Mounds, or Tumuli, are now recognised as offshoots of the Aztec, and the still earlier Toltec cultures of Mexico, which in its turn was derived from the ancient Maya civilisation of Central America. Dr. Means states that he found "gross evidence of syphilis in these skeletons; they presented varying degrees of involvement, from simple periosteal thickening and roughening on the crests of the tibiæ to thickened ivory-like bone invading the medullary canals, with gumma formation."

Disease as a Factor in Evolution.

Long ago Lyell [14] laid down the important geological principle that changes in the past are best interpreted by similar processes seen at work in the present. Thus Osborn [2] points out how vast herds of wild buffalo were exterminated in South Africa between 1890 and 1893 by rinderpest, which also killed off almost completely the wildebeeste or gnu and the giraffe. Moreover, fly-borne diseases such as surra have been powerful agents in the destruction of the equidæ, just as the *Trypanosoma brucei*, carried by *Glossina morsitans*, causes the fatal nagana in domesticated horses and cattle. Several species of tsetse-flies of the genus glossina have been found by T. D. A. Cockerell [5] in a fossil state in the florissant shales of Colorado, which are of Oligocene (mid-Tertiary) age. Whether these flies could carry trypanosomes we do not know, but at this part of the tertiary period horses were evolving very rapidly, and epidemic forms of nagana might have had marked influence on their extinction or survival. It is curious that horses are found in America up to the end of the Tertiary period, but after that they disappear completely, and had to be reintroduced by man when the country was first colonised.[15]

Modern biologists and palæontologists lay great stress on persistence as a characteristic of the evolution of certain lineages. The most frequently quoted example of this is the brachiopod lingula, whose fossil shells are found in the ancient Cambrian deposits, and which yet has persisted through all the subsequent epochs, and lives to-day on the shores of our tropical seas. Its form has scarcely varied during these æons of time and has withstood all the stresses and strains of environmental change, while all its collaterals have perished, or spent themselves in varying to suit their changing circumstances. The modern exponent of evolutionary methods talks of an inherent persistence or invariability, in such a lineage, so that energy is not used up in starting new phylæ, but is only employed in carrying on the main stem. Lang [16] gives us his idea of one aspect of the evolutionary process, thus: "Our supposed primitive organism then, tense with potentiality, curbed by inhibition,

periodically breaking out as inhibition, is removed in bursts of evolution along similar and definite lines, is a very different creature from the passive organism of the orthodox Darwinian, which conveniently varies in all directions, and allows natural selection to determine the course of its evolution." It is true that Dr. Bather,[17] the eminent palæontologist of the Natural History Museum, South Kensington, has stated that Lang has gone too far in postulating such "an insistent tendency in living organisms, and by putting the environmental factor so much in the background." But those of us who are always coming in contact with pathological phenomena must realise that a powerful element in this struggle is the acquirement of, or failure to acquire, an immunity. Modern bacteriology has taught us that this does occur, and examples of it are seen in everyday life among man and animals.

The fall of classical Greece and the triumph of Alexander of Macedon is now believed by some [21] to have been largely due to the crippling of the inhabitants of that country by malaria. It has even been suggested that the invasion of Eastern Europe by the Turkish hordes in 1358 [22] was the result of the devastation and partial extinction of the populace in the previous few years by the Black Death or Plague; and we all know how cholera, measles, and syphilis have played similar parts in different areas. In the same way the large vertebrate fauna have been more or less decimated at times by rinderpest and other zymotic diseases. Osborn,[2] discussing the close parallel between the present fauna of Central Africa and that of North America in Tertiary times, says: "From these recent discoveries it appears that immunity from disease is one of the most important features of animal adaptation to environment, and that, conversely, non-immunity has probably been one of the most potent causes of diminution and extinction."

One cannot but feel certain that disease in its various manifestations has played a much greater part in the evolution of the different forms of life in this world than the biologists have ever realised.

Bibliography.

1. Walcott, C. D.: Proc. National Acad. Science, 1915, i. Idem: Smithsonian Miscell. Coll., lxiv., No. 2.
2. Osborn, H. F.: Origin and Evolution of Life, 1918. Idem: American Naturalist, 1906, xl., 793–4 and 829.
3. Adami, J. G.: Medical Contributions to the Study of Evolution, 1918, including Croonian lectures, &c.
4. Renault, B.: Bull. de la Soc. de l'Industrie minérale à Saint-Etienne, sér. 3, tome xiii. (quoted by Moodie).[5]
5. Moodie, R. L.: Antiquity of Disease, 1923, Univ. Chicago Press.
6. Idem: Surgical Clinics of Chicago, April, 1918, ii., 319.
7. Boule, M.: Les hommes fossiles, 2nd ed., 1923.
8. Parry, T. Wilson: Brit. Med. Jour., 1923, ii., 457.
9. Ruffer, Sir Marc Armand: Studies in the Palæopathology of Egypt, 1921.
10. Smith, Elliot: THE LANCET, 1908, ii., 521.
11. Discussion on Syphilis, Proc. Roy. Soc. Med. (General Reports), 1911–12, v., 21.
12. Voberg, Gaston: Über den Ursprung der Syphilis, Stuttgart (quoted in Brit. Med. Jour., 1926, ii., 1235).
13. Hayhurst, E. R.: Brit. Med. Jour., 1927, i., 596.
14. Lyell, Sir Charles: Principles of Geology, 1833.
15. Woodward, G. Smith: Vertebrate Palæontology, 1898.
16. Lang, W. D.: Proc. Geologists Assoc., 1919, xxx., 102, and 1925, xxxvi., 227.
17. Bather, F. G.: Advancement of Science, Brit. Assoc., 1920.
18. Archæological Survey of Nubia, 1908, Bull. i. and ii. (Egypt. Government).
19. Hrdlicka: Smithsonian Inst. Ethnology, 1908, Bull. 34.
20. Antiquity, June, 1927, p. 232.
21. Jones, W. H. S.: Malaria and Greek History, 1909.
22. Cullen, G. M.: Brit. Med. Jour., August 20th, 1927.

PRISON BREAKERS.[1]

THERE is always something of psychological interest about prison breakers, for their deeds are committed by individuals who show that the impulse to infringe social barriers holds good when they find themselves confined in a material sense. The popular story of Jack Sheppard, when inquired into, seems to be really true; indeed, Harrison Ainsworth has hardly done justice to the ingenuity with which his hero escaped from Newgate; while Jack Sheppard's similarity in psychological make-up to Haggart, the famous Scotch prison breaker, is remarkable, for in each case these resourceful rogues appear to have been mainly led to crime through vanity. Perhaps more widely known than either as one for whom locks and bars have no terrors is Baron Trenck, and his exciting adventures form the longest essay in the book. Except perhaps Latude and Casanova, mention of whom the author omits because their exploits are over familiar, Trenck has the widest fame for prison-breaking, and his adventures are certainly better documented than those of Casanova. Mr. Philip has produced a very readable book.

[1] The Prison Breakers. By Alban M. Phillip. London: Philip Allan and Co. 1927. Pp. 282. 10*s.* 6*d.*

A NEW MEDICAL JOURNAL IN INDIA.

WE have received a copy of the first issue of the *Sind Medical Journal*, the quarterly production of the Sind Medical Union, edited by Dr G. F. Rodrigues, who held a number of resident appointments in London hospitals ten years ago. The issue contains a series of short articles on keratodermia blenorrhagica, furunculosis of the face, cancer of the breast, and intussusception. The first-named disease is one of the rarest in the whole of dermatological literature and the case described is not very convincing. The suggestion to treat scabies in man by the oral administration of sulphur deserves a trial elsewhere, for 18 cures are claimed. Apart from these scientific papers, a number of highly controversial political matters are touched upon, and the editorial article makes no attempt to define the policy of the journal. The publisher is Dr H. J. Wania, at the Daily Gazette Press, Karachi, and the annual subscription (inland) Rs.2.0.0 and (foreign) Rs.2.8.0, post free.

HONOURS TO MENTAL NURSES.

IN our annotation on the New Year Honours which appeared in THE LANCET of Jan. 7th (Pp. 35) while mentioning the appointment of Miss M. M. Thorburn, matron of the London County Mental Hospital, Horton, we omitted to mention the name of Miss Jane Mottershead, senior assistant matron to the Cheshire County Mental Hospital at Macclesfield, who was appointed to be a Member of the Civil Division of the Order of the British Empire. The mental nurse receives little enough recognition of her devoted service in a very exacting branch of the nursing profession, and it is peculiarly encouraging for her to find the value of her work recognised in this way. Among the Officers of the same Order appears the name of Mrs Isabel Brogden Carter, a member of the Mental Deficiency Committee in the same county.

A BOOK OF DAYS.

IN "Roses, Marjoram and Nettles," (London: Methuen and Co. Ltd. Pp. 388. 5*s.*) Miss Adelaide L. J. Gosset has tried to give her readers glimpses into "the mysterious teeming life of long ago." She has selected men and women belonging to almost every profession—authors, engineers, lawyers, generals, architects, statesmen, inventors—giving quotations which throw them and their work into relief. Edward Jenner is amongst the few medical men included, with a quotation from Isaak Walton which runs: "Jenner pleaded with Napoleon on behalf of some British prisoners, and Napoleon was on the brink of refusing to release them, when Josephine whispered the name of 'Jenner,' upon which Napoleon said, 'There is nothing we can refuse that man.' Jenner was triumphant." Certain days are reserved for recalling events such as the passing of the Bank Holiday Act, the opening of the London docks, All Fool's Day, the Founding of the Royal Society, the chartering of the Zoological Society of London. The quotations are extremely varied and many of them quite entertaining.

NEW PREPARATIONS.

Messrs. Burroughs Wellcome and Co., London, have sent us "*Wellcome*" *Antipneumococcus Serum, Type I.* Serum protecting against infection with Pneumococcus, Type I. in laboratory tests is now widely used in the treatment of pneumonia. Such a serum is prepared at the "Wellcome" Physiological Research Laboratories. Antipneumococcus serum is tested against cultures of pneumococci of such virulence that 0·000 001 c.cm. of an 18-hour culture will kill a mouse. A dose of 0·2 c.cm. of "Wellcome" brand Antipneumococcus Serum, Type I., will protect a mouse against 0·1 c.cm. of the culture—i.e., 100,000 fatal doses. It is thus reasonable to expect favourable clinical results. "Wellcome" brand Antipneumococcus Serum, Type I., is supplied in phials containing 25 c.cm.

Bismogenol, which is recommended for use in various stages of syphilis, is prepared by Messrs. E. Tosse and Co., of Hamburg, and imported by Messrs. Boxall, Smith and Co., 163A, Strand, London, W.C. It is an example of modern bismuth therapy, and contains 60 per cent. of bismuth combined with oxybenzoic acid. The contributions to the German medical press on the non-toxicity and successful action of the preparation are numerous, and a good many of the reports either emanate from hospitals or have been made to general or special medical societies. The technique of the injection is the same as that for the insoluble mercury salts; it is recommended that 1 c.cm. should be injected every third, fourth, or fifth day into the upper external quadrant of the gluteal muscle, up to 25 injections being given, though the dose can be made larger without danger. It is stated in the medical observations that pain does not occur, so that if the syphilitic symptoms appear to the doctor to warrant a more drastic course of administration there will not be any distressing resistance from the patient.

THE temporary address of the National Association for the Prevention of Tuberculosis is 1, Gordon-sq., London, W.C.1.